

JIM SKEEVERS
OBJECT
LESSONS.



ON RAILROADING FOR
RAILROADERS.



Jim Skeevers' Object Lessons

On Railroading
for Railroaders

John A. Hill

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PREFACE



A fact, a rule, a law or a principle of mechanics, when stated simply and alone, is hard to remember—especially so to men who do not make daily use of the statement.

Recognizing that the same thing can be remembered, and the truth and value of it be quicker recognized, if clothed in the garb of a story, a trite saying, or a poem, the author commenced these insignificant little preachments some ten years ago.

He wanted to teach some things to locomotive engineers, firemen, master mechanics, etc., and took this way to impress on their minds the lessons.

Of the true life of the men who operate and maintain the American locomotive, no man can write, talk or think understandingly, except he has devoted some years of his life to living and working and sympathizing with them—and this the writer has done.

Under the pen name of John Alexander, these little sketches went out to the railroad world through the columns of "Locomotive Engineering," and were received, enjoyed and appreciated far beyond their true merits.

The author now gathers them into this little volume, partly for the benefit of those of his old friends who enjoy such things, and partly for his own satisfaction.

JOHN A. HILL.

New York, October, 1899.

The Way Engineer Skeevens Illustrates a Point.

Jim Skeevens runs a freight engine on a road where the men do pretty much as they please—so long as they pull the trains. To be sure, there is a monthly bulletin of coal and oil used and repairs made, but no one is censured for using too much or complimented or paid for using little. The firemen are not required to clean much and—it's a pretty easy place to get along.

But Skeevens prides himself on economy of fuel and oil, in doing his work well, and getting along with a reason for everything. Among other things, Skeevens likes to see his engine wiped off and the front end and stack neatly blackened, and Skeevens' fireman generally has the neatest looking engine on the road.

Other firemen quit cleaning cab brasses, wiped the jackets about once a week instead of daily, and quit painting the front end altogether long ago. Then they guyed Skeevens' fireman, and called him a fool and a sucker and a chump, till Skeevens' fireman got sick of it and struck for liberty. He didn't wipe the dust off her, and she went out with her front end looking pretty scabby—for Skeevens.

When Skeevens got to the engine in the yard the other day he put his sieve-can in the box, got out his overclothes, put them on, and started around with the long can. Billy sat on his seat and smoked a cob pipe.

Skeevens got up on the deck, wiped off his can, and remarked rather hintfully:

"Forgot to dust her off this time, didn't ye, Bill?"

"No," said Bill, "I got sick of being guyed by the rest of the gang, and called names, and bein' accused of trying to make firemen do more work, and cleaning for my ride after firing for my day's pay and all that."

"Billy," said Skeevens, "it's all right;

don't blame you at all. It takes a long time to find out that you know your own business best. Now, haven't you often heard it from all quarters that we had the best-looking engine on the road? Yes, 'course you have. Don't she run lightest on coal and on oil? Never was beat. Do you have to wipe a dose off her once a year because she was too full of water? No; because we are careful and take pains in our work. We may be suckers, but it's a good deal of satisfaction for me to know we're doin' our work about right—near as we can, anyhow. But it's wrong, I guess, Billy, dead wrong, after all. So let's do as the rest do; you fire and clean just as the other boys do, and I'll run just as the other runners do; there's no use in bein' odd."

Billy had expected a row with Skeevvers, and felt quite relieved that he took to the change so good naturedly, and in a few minutes both were busy, as they pulled out with a big train.

Skeevvers jammed the injector on full just as they started, and Billy had a hard half-hour's work bringing his green fire up, with the pressure down 20 pounds; he was tired and sweaty when the engine commenced to churn water through her stack, plastering the front windows with dope. Skeevvers jerked his head inside the window, smiled, said he forgot it, shut off the injector, and eased off the throttle, then she commenced to howl, and Billy opened the door.

Skeevvers was working her down a notch further than usual, and it told on the coal pile, and Billy remarked that it was an awful hard pulling train, by way of calling Skeevvers' attention to it, but Skeevvers agreed that the train did pull hard.

Skeevvers forgot to put the injector on again till the water was down to one gauge, then he acted startled, and put it on full. The fire was low, and Bill had another fight. This was repeated all day, and each time the coal got further and further away.

Half-way over the division they took 150 bushels of coal, where they never took more than 100.

Skeevvers kept good-natured. Bill was mad.

"I think you are doin' this a-purpose," said Bill, at last.

"Doin' what?" asked Skeevvers, as innocent as a child.

"Why, pounding this engine so hard, and workin' water, startin' out in the corner, wide open, and pullin' my fire all to pieces."

"Is there any other engine on this road that don't burn more than 6 tons of coal over this division?" asked Skeevvers.

"No; but she never burnt but 4½ and 5 before," said Billy.

"Yes, but that was when we was both careful and worked together," said Skeevvers, as he prepared to get off at the end of the run; "but none of the rest of the engineers are careful about coal; what's the use of me being? And when a man works as hard as you have to-day he would be a fool to put in an extra hour cleaning and fussing around; we get just as much money when we don't as when we do. Good night, Billy."

The next morning, when Skeevvers came down to go out, the "Mary Ann" was wiped up, her front end black, and Billy was whistling "Annie Rooney" and spitting on the side windows to make the whiting take hold.

"Skeevvers," said he, "I'd a good deal rather put in half an hour a trip cleaning up than to shovel coal against that extra notch and an injector that 'forgits.' Just run her like you used to, Skeevvers, and I'll keep her tidy."



Jim Skeevers Explains a Principle.

Skeevers' fireman, Billy, has been "sot up" a fortnight now, and the Old Man put Mike Kelly on with Skeevers.

It's Mike's next turn to do the "touch the button, the fireman does the rest" act, and the Old Man thinks Skeevers a good runner to graduate the boys.

Skeevers is no hog; he knows that Billy is the best fireman on the road, and did lots of his work, and that the next fellow will make it harder for him, but he's been thinking of Bill some, and rejoices in his promotion—he has an interest in his success.

Mike was born with a constitution that could stand worlds of rest, and probably he also inherited some of his propensity for never going to bed until the last cat is hung, and then hating to keep awake the next day.

Mike, in common with other mortals, must suffer the ills of his inheritance; but Mike, and all the rest of us, suffer more from the desires, habits and practices that environment has established than from inheritance—or anything else.

Mike didn't get the right kind of an engineer to start with, so now, after firing four years, Mike knows a lot of things about locomotives that are not so and has learned a lot of things that he must unlearn, and formed a lot of habits that must be broken.

Perhaps the Old Man knew this, and put the job onto Skeevers, and blames Mike and his first engineer; but why didn't the Old Man tumble to all this three years ago, before Mike's crooked habits got "set," so to speak. These Old Men make lots of curious engineers out of firemen of their own selection, and then go off and kick about them—but that's nothing to do with Skeevers and Mike.

Mike's worst habit, as it struck Skeevers, was sleeping on the engine. Skeevers is down on that; he knows that it is

dead wrong, to begin with, and Skeevers carries a big scar that he got one night, a long while ago, when he was firing for a man who slept on duty; the man has slept ever since—in a graveyard. That was an object lesson to Skeevers, and Skeevers maintains that one good object lesson is worth more than two books, or four or five hundred "tellings." So Skeevers concluded to give Mike a few object lessons on sleep, and how not to do it on an engine.

Skeevers pulls fast freight, generally having enough refrigerator cars or fruiters ahead to handle the train with air. The division is long and hilly; some places the train will run for eighteen or twenty miles.

The first trip out Mike attended to his duties pretty well, but got dozy on the long stretches between fires; but the second trip he went fast asleep, and Skeevers had to wake him up to get over Waxem hill.

The next night they had to double out, and as soon as they pitched over for a ten-mile run, Mike fixed up his fire a little, and sat down.

"Mike," said Skeevers, "don't let me forget; I have orders not to pass Ford's without orders—don't let me go to sleep."

"All right, Skeevers," said Mike, "where do you meet 'Three'?"

"At Ford's," said Skeevers.

Mike closed his eyes directly, just to rest 'em a little; then he looked around, owl fashion, kind of thought he saw his best girl ahead of the engine, nodded to her, made a profound bow, and—was off. The engine? No, no; off to sleep—"pounding his ear," Mike calls it.

Skeevers sailed by Ford's, and took the siding at Sand Creek, all "unbeknownst" to Mike.

When "Three" thundered by Mike jumped up, put in a fire, and asked Skeevers if he had his orders yet.

"What orders?" asked Skeevers.

"That 'do not' at Ford's."

"We're by Ford's, and I didn't get the orders," said Skeevers, in an awed tone of voice; "it's a wonder we didn't hit 'Three.'"

"You're in for it, Skeevers, I guess."

"So are you."

"Not much; I'm no bold engineer."

"I told you to look out, and not let me go to sleep; I believe you were asleep yourself."

"No, sir; I was drowsy, but not asleep."

"Not asleep? well, you had your eyes shut."

"Yes, but it wa'n't sleep."

"What was you thinking about when we passed Ford's?"

"Nothin'."

"Well, Mike, if you shut your eyes and stop thinking, it comes nearer being sleep than anything I know of. We'll probably get fired, or get ninety days for this."

Mike was wide awake the rest of the way in, but Skeevers appeared glum and downhearted. The head garter came over near town, and Mike told him about it, and the garter said they had orders to meet "Three" at Sand Creek, and no "do not" at Ford's. Mike accused Skeevers of "playing smart," and Skeevers asked Mike how different it would have been had the case been genuine.

A few trips later Mike started a snooze in good shape, and Skeevers quietly let the "48" drift against a slight grade and stop, steam low. In twenty minutes the conductor came over, swung up into the gangway, and asked Skeevers what was the matter with the "48."

"Nothin' at all," said Skeevers, "nothin' at all, but the fireman is worn out for sleep, and has laid off; I have no fireman."

Mike was awake then, and heard the talk.

"I ain't paid for firing or keeping the fireman on duty," continued Skeevers; "if Mike wants to lay off it's his business and the Old Man's—not mine. I won't run without a fireman, though—not a mile."

The conductor consulted his watch.

"Can't get to Sand Creek for 'Three' now; what'll I say was the cause of delay?"

"No fireman," said Skeevers.

The conductor went back over the train, and Mike nursed his wrath a while, and then turned loose:

"Skinny Skeevers, how long you goin' to work this racket, and make such a darned fuss about a man's dozin' a little, and reportin' every little thing?"

"Just as long as you sleep on duty, Mike," said Skeevers; "I won't run a rod

with you when you are asleep; I will stop just as quick as you shut your eyes, let the circumstances be what they may. I shall not let the conductors lay any such delay to bad coal or leaky flues. It must all be charged up to 'No fireman.' If you stay on the road you will soon be running an engine here, and if you sleep on duty now you will then, and it will all end in your killing yourself, and perhaps someone else—very likely me. If you stay on the road, and on this engine, I will break you of sleeping—you are liable to be fired any day for good cause, however."

Mike kicked some, all to himself; but he is keeping awake pretty well, and if Skeevers just lets a little air out of the brake valve now, Mike will straighten up and say:

"Oh, I ain't asleep, Skinny; bet your neck I'm all right."

Skeevers says it will take six months to make a permanent cure, and remove the tendency of fatal symptoms to return; but Skeevers says he'll fetch him, and still has an abiding faith in object lessons.



Jim Skeevers and a Gentleman.

Skeevers was "acting master mechanic" once while the real article went "down East," got married, and honeymooned around a while for all the world like a common engineer or a human being.

Skeevers didn't make any startling changes, but while he sat in the office he was boss, all the same, and he put the knife into every sore caused by friction between engineers and firemen.

They couldn't any of 'em shut Skinny Skeevers' eye with a five-act story—Skinny knew all the stories by heart, and the men, too.

Skeevers went over the road with the officials on a tour of inspection once, and saw, for the first time, a middle-aged scrapheap on the Coalville branch, and Skeevers made a note in his book that the "'38' was the dirtiest engine he ever saw."

When he got back home he wrote a letter to the engineer, saying that he was ashamed of the engine and of him; that whoever the fireman was, he, the engineer was responsible for him, and that if the engine wasn't at once put into decent condition the engineer would hear something drop.

In a couple of days a reply came in, couched in very dignified language; there was no excuse for the dirt, no promise to remove it, no word about the fireman, but a protest against the summary way that Skeevers wrote.

"I want you, sir, to distinctly understand that I am a gentleman and shall insist on being treated as such," concluded the epistle of the offended "plug-puller" of the branch run.

Skeevers sent him a pass by the first train—and also a man to relieve him.

The next day he climbed the stairs to Skeevers' office with three gauges of indignation on. Skeevers knew he was coming, and was busy writing.

"Is Mr. Skeevers here?" he asked, as he leaned his arm on the railing.

"What do you want to see him about?" asked a fresh young clerk.

"I want to see the master mechanic of this here road," said the gentleman from Coalville.

"I am that person," said Skeevers, quiet like. "May I ask who you are?"

"I am the engineer of the '38."

"Oh, yes; let's see, how long have you been running an engine here, sir?"

"Six years, and I"—

"Never mind, now, but don't you draw pay from this company for another position?"

"No, sir!"

"Just hired for an engineer and paid for that and nothing else?"

"Yes, sir."

"I'm glad to know that; I got the impression from a letter you wrote me that you were down on the pay-rolls as a gentleman. They may need some of them in other departments, but I want engineers, firemen and mechanics; I wouldn't give the best gentleman in America \$20 a month for my part of the work.

"I understand, sir, that you are connected with some of the first families here, but that cuts no figure with me. After working-hours you may lead the German at the Governor's ball if you want to, for all me; but while on duty here you are in charge of a locomotive, and are responsible for it to me, and I to the management. I don't care a continental cuss whether you were born in the White House or the gutter, who you married or what church you belong to. It cuts no figure here, as I remarked before.

"I do care what kind of an engineer you are, though, and you can't be any better engineer because you belong to the Masons, the Episcopal Chnrch, the Green-back party or the Holy Rollers. Marrying into the first families won't help you, and being born in a hovel won't hurt you—as an engineer.

"It's an engineer's duty to see that his engine is kept reasonably tidy; the fireman should do most of this work under your direction, but you are as responsible for that as you are for the packing of the valve-stems.

"Now, sir, this road wants good engineers, and gentlemen would be a drug on the market. If you want to try running

the '38—as an engineer, mind you—I am willing. You go right ahead and marry a wench or a Pawnee squaw, if you want to, and tell 'em all it's none of my business; but if you don't clean up that engine before Saturday night, I will fire you off the face of the earth and hire an engineer.

"Give Mr. Pangborn a pass to Coalville, James. Good-day, sir."

"Good-day, Mr. Skeevers."

"That's what I call a dry roast," said the chief clerk, as the gentleman runner shut the hall door at the foot of the stairs.

"That's what my old fireman calls an object lesson, illustrated," said Skeevers, "and, whatever it is, I know that Pangborn sees something in a different light than he did, and he won't forget it, eyether."



A "Holy Terror" Steamer in the Hands of Jim Skeevers.

Skinny Skeevers, him of the object lessons, ran Mike Monnihan's engine for a long time, while Mike went to visit the "ould sod," and Skinny's engine got a new firebox and a coat of varnish.

The first time Skinny oiled around, he yelled up to Patsy Killigen, the fireman, to put on the injector, and cool her off, so he could see the oil holes; she was howling so it gave him the blind staggers.

"How does she steam, Patsy?" asked Skeevers, as they started out.

"She's a 'holy terror' for wind," said Pat, proudly. "She's always crazy wid it."

Skeevers was somewhat annoyed at the constant howl of the pop, but it did little good to speak to Pat—Pat fired by the pop, and a "holy terror" was his ideal.

Skeevers thought he'd try an object lesson.

"What size nozzle has she got?" asked Skeevers.

"Oh! Lord, you ain't agoin' to go monkeying with her nozzles, are ye, Skeevers? They are $2\frac{1}{2}$ or 3-inch now."

"She burns too much coal, and howls too much."

"There hain't another steamer like her on the road," moaned Patsy. "Why, you can't shut off her throttle, but up goes her white tail—steam! Why, she's the darlin' of 'em all, Skeevers."

Skeevers got a smaller scoop, but Patsy plied it industriously, and the "96" still held the first prize as a "holy terror" for steam.

Skeevers bribed the coal shovelers to put on a tank load of lumps, none to weigh less than 200, but Pat paralyzed the lumps and reported the coal shovelers beside.

Skeevers thought of putting a flat car between the engine and tender, but gave the idea up as impracticable.

Patsy would put in a fire within two minutes of a regular stop, and be happy when the black smoke rolled, and the white feather stood proudly up 48 feet above the howling pops of the "Holy Terror." Skeevers was in despair.

"Pat, did you ever stop to think that you are shoveling a lot of coal through that pop for nothing?" he asked.

"I don't mind the work, Skeevers," said he. "Don't mind it a bit; it makes the other lads green wid envy to see how she do steam."

"But it wastes coal."

"Bless ye, me boy, the company own their own mines, and it's proud they ort to be to have such steamers."

Skeevers couldn't get Patsy mad, and could awaken no other feeling in his heart but worshipful admiration of the prolific steam production of the "Holy Terror."

The run was a light passenger one, and after some scheming Skeevers got Pat and the "Holy Terror" on heavy freight run for a week. Skeevers managed to use all the steam that was made on the road, but Pat insisted on a pop solo at every stop.

Skeevers hated to disturb the front end adjustment of another man's engine; he finally determined to enlarge the nozzles, but concluded that this might give them trouble on the road, and besides that, Skeevers didn't believe in patching an engine to repair a man, any more than he believed in feeding a fireman soda ash to keep scale out of a boiler.

But right here the road got a new master mechanic, and the very first month he put up a bulletin of the amount of coal burned on each engine, and the "Holy Terror" was away down in the middle of the passenger engine list.

Pat was pretty mad about it, and said, if they would figure on who made the most miles or the most hours with the steam pressure at or above 140, he and the "Holy Terror" would take first money.

The next month he stole a few lumps of coal, gave the shovelers cigars for big measures, etc., but the bulletin appeared again with the "Holy Terror" advanced but one point.

Then came a bulletin notice that firemen would be promoted on merit, especial preference given for a coal record.

Pat had a nightmare that night when he thought of the "Holy Terror" and himself at eighth place, and Jim Bean, who was hired four months after he was, leading the list for coal—and promotion.

That evening after they got to going up the hill, and the pop sat down to rest a minute, Skeevers called Pat over, and, in a friendly way, told him that the Old Man had said he should have to promote three or four men in the fall, and that he was afraid that Pat would lose his chance and see a lot of younger fellows pass him, if he didn't mind. Skeevers suggested that the main trouble was with the "Holy Terror," and not Pat, and proposed that they prove it to the Old Man by having Pat transferred for one month to the "94," that was then leading the coal burners.

Pat agreed to this if Skeevers would arrange it—he didn't know that Skeevers had arranged it.

When the next bulletin came out, the "Holy Terror" was at the head, and the "94" was fifth. Pat was improving some.

Pat was glad to get back with Skeevers and the "Holy Terror"—said Old Man Martin on the "94" kept "picking at him" about opening the door and monkeying with the dampers.

Jimmy Bean was sent to running switch engine in a week or two, and Patsy's heart was broken.

"Skeevers," said he "I'm disgraced. What the devil is the matter with the '96,' or—or—me?"

"The '96' is, without a doubt, the best engine on the road, Patsy," said Skeevers, "and honestly I think you are the best fireman, or rather would be the best, except that you haven't figured out plainly just what you are trying to do—you don't realize what you burn the coal for."

"To make steam, of course," said Patsy.

"What do you want of the steam?"

"To pull the cars av course."

"Where do you put it for that?"

"Into the cylinders, surely."

"Suppose you have more than you want?"

"Out of the pop she goes—can't hurt nothin'."

"But the coal pile?"

"Coal pile?"

"Yes, don't it take as much coal to make steam to blow through the pops as

it does to make the same amount of steam to be used in the cylinders?"

"But there don't much go out of the pops."

"That's where your mistake has been, Patsy. Pop Martin told me this morning that if he had all the steam that the '94' made and wasted at the pops while you were on her, he could make four round trips without coal or water."

Pat put in a fire and gave a big lump a few vigorous whacks with his coal pick, and then came back."

"I've a notion to quit, Skeevers," said he.

"You fire this engine the best you know how for another month, take my advice, and if she don't head the list, I'll quit," said Skeevers.

"You want to remember that in making steam to throw away, you not only waste fuel to make it, but you waste water. Water is cheap, but it takes coal to haul it around, and the '96' takes more water than the other engines do, and hauls many tons of it a month for nothing; then we have to stop for water oftener, and that takes coal—takes coal to stop and coal to start."

"Coal to stop; how d'ye make that out?"

"There you are again, Pat; you see you haven't figured on your business or followed cause and effect up very much. Don't you know that it takes just as much power to stop a train, leaving out friction, as it does to start it?"

"When you set the brake it commences to use up and lose 'stored energy' that has been put into the train by the coal, through the medium of the cylinders.

"Then your brake will use more steam to get its pressure back again, and the '96' will get rid of more coal to get the train back into motion, and use more to haul the extra water. It all counts, Pat, because we do this all day, every day in the month; if it was only once it wouldn't amount to much. Think about your work, and figure on how little you can do in the way of coal shoveling to get this train over the road, and I will bet on the result."

Last Thursday the new bulletin was put up. The "Holy Terror" stood at the head, and Patsy Killigen hummed "Comrades" as he was polishing the hand-rail

in the roundhouse, when the Old Man came along, touched Pat's leg with his umbrella, and said:

"Come into the office after dinner—I want to talk with you.



Jim Skeevers as Traveling Engineer.

The regular man took a ninety-days' leave a while ago to go East, and Jim Skeevers was appointed traveling engineer, *pro tem.*

Skeevers' principal duty seemed to be examining firemen for promotion and going out to buck snow.

They have a new general superintendent and he is a terror on examinations. He ordered all the engineers, old and young, examined on time card, and if one of them wavered he sent him to the master mechanic for a mechanical examination.

Finally he turned this around and ordered Skeevers to examine all the engineers, and if any of them wavered in the mechanical line to send 'em to him.

The day after the order came out the Stove Committee were discussing it, when Skeevers came through the roundhouse.

"Skinny Skeevers fired for me ten years ago," said Si Lapan, "and I don't guess he'll monkey examining me much." Here he saw Skeevers and continued:

"Say, Skinny, do you intend givin' us old timers the same question to answer as you do these young ducks?"

"Yes. What's the use of doing a thing 'less you do it right? If you know the answers better than the young fellows, so much the better for you."

"It's all poppycock; ain't I run here twenty years?"

"Yes, but the new management have made many changes and are going to adopt a new book of rules; trains are getting thicker; we have some signals; we're using joint track, and, all in all, a fellow has to be pretty well posted to keep out of trouble. The fault with you old fellows is that you don't keep posted —you learned how once, but never kept track of improvements."

"I'll bet you I kin answer more questions than you can, come now."

"Oh, I'm not setting myself up for an

example. You will pass on your merits, no doubt. Now, there has been two dozen young fellows examined, and the same question is asked 'em all first. You don't keep track of the run of things, and I'll bet you can't answer it now."

"Bet you the cigars."

"All right; for the crowd, Si."

"For the crowd."

"Well, Si. What is a time card?"

"Oh, Lordy! What's a time card? Why, well, a time card is a—well, it's a thing to run trains by."

"No, it is'n't."

"Well, it's the thing that tells the first-class and second-class trains apart, and which has the right of the road, and where to meet, and where to stop, and when."

"Not much; you're thinking of the book of rules; we're talking about time card only."

"Well, it governs the running of trains."

"Say, Si, if you were out here at Dodd's on 'No. 1' and '22' wasn't there, what would you do?"

"Go ahead; 'No. 1' has the right."

"Suppose you were on '22'?"

"Well, if I could'n't get there, I'd lay back at Somers."

"Yes, but the time card makes you meet 'No. 1' at Dodd's."

"But if you could'n't get there—"

"Then how does it govern the running of trains? The book of rules does that. Si, you don't know. Well, I'll tell you, as this is no regular examination. A time card is a list of the stations and the time at which *it is proposed* to have the trains arrive at or leave such stations."

"I smoke perfectos, don't you, boys?"



Smoke Preventing—Jim Skeevers and the Fourth Vice Try Experiments.

There is going to be a reform on Jim Skeevers' road about smoke-making, or smoke-preventing. We know there is going to be a reform because the fourth vice-president says there is, and he knows.

The Fourth Vice has read three scientific books on combustion, and all by his lone self wrote out a bulletin notice about preventing smoke, that showed he was master of the subject. When the boys consulted the bulletin board one morning they read the following: Official Order, No. 39. (The Fourth Vice was educated at West Point and married the president's daughter.)

OFFICIAL ORDER, NO. 39.

The careless habit of enginemen in allowing black smoke to issue from their engines must be discontinued from this date. By firing in such a way as to distribute the carbon evenly on the grates and admitting about four-fifths of the total volume of air to the ash-can and one-fifth above the fire, the oxygen and hydrogen will mix and all smoke will be consumed before reaching the flues, thereby abating a nuisance and showing a great economy in fuel. Controllable air jets will be put on all passenger engines at once; but men on freight can prevent smoke by putting their fire door on the first notch of the latch for one and a half minutes after each new supply of fuel, then closing it. When the engine is standing, open fire door and put on the blower slightly.

The penalty for a disregard of this rule will be instant dismissal from the service.

JOHN MASSEY, Gen M. M.
Approved, A. VERRY NEWE, Fourth Vice-President.

Of course, all the boys knew that the Old Man, John Massey, was never guilty of writing anything about oxygen and hydrogen, and that he knew too well how

heavy the trains were and how much coal they had to burn per hour; then, years ago, the Old Man fired and run, and he would just as soon expect the men to obey an order to hold their left hands on the seat of their pants when passing all mile-posts as to half close the fire door for one and a half minutes after each fire.

Skeevers pulls the express freight. It's heavy, the time is lively, and the "93" never was known to go over the road without burning coal; never was known to burn much coal without some smoke; never was known to steam any too well with the fire door shut, and never was known to steam at all with it half open.

Skeevers determined to work in an object lesson on the man that wrote that bulletin. (Skeevers' specialty is object lessons.)

Skeevers went home and put on his store clothes and presented himself at the office of A. Verry Newe, fourth vice-president.

He worked his way past the outside guard, made the grand hailing sign of distress before the altar of the "assistant to" and was permitted to send in his name and business on a little piece of paper. He wrote:

"Skeevers, engineer '93'; come to get help and advice about smoke-prevention."

He was admitted to the holy of holies, salaamed before the Fourth Vice, hung his hat on his left thumb, and said:

"Mr. Newe, I am very much interested in smoke-prevention. I think it can be entirely stopped if the men are instructed right. Now, what I called for is this: I think if you can get one engine to run without smoke you can make the other crews do as her crew does, and the job is complete; it would take two years to instruct all the men on the road. Now, I want the honor of having the first smokeless engine. You know that my train—the express freight—is considered of the most importance on the road. You sidetrack passenger trains for it every day. Now, I thought I could get you to put on some old clothes and go out with us this afternoon. You know more about smoke-prevention than anyone else because you have made a study of it (the Fourth Vice smiled here and stroked his mustache approvingly). The signals are so thick and

the importance of time so great that I cannot watch the fireman and give him the right instruction; but if you would sit on his seat for half a trip and tell him when to shut the door and when to leave it on the latch and prevent him from using too much coal at a time, I think the '93' would throw no smoke and be an example to all the rest."

The Fourth Vice agreed to Skeevers' plan, and Skeevers went home with a pay-day smile on his phiz.

That afternoon as the "93" backed down on to her train, A. Verry Newe, fourth vice-president, stepped upon her hurricane deck, and Skeevers introduced him to the fireman, Pete Doyle.

"Mr. Newe; my fireman, Mr. Doyle. Pete, Mr. Newe is going over the road with us to give us a few pointers on smoke-preventing. You fire just as he tells you; I am anxious that the '93' should be the first to run without smoke."

Pete said "All right, sorr," but there was a sneer under the coal dust as he glanced at the "dood collar" and effeminate face of the Fourth Vice.

The Fourth Vice got a clean piece of waste to wipe his hands, and looked around nervously. He had never been on an engine before with any responsibility at all.

Skeevers oiled around, and then shut himself upon his side of the boiler—the "93" was a mogul—and said to Mr. Newe:

"I shan't be able to notice you much, as it keeps me pretty busy with the signals and all; but Pete will do just what you tell him, and I am sure we shall learn something before we get over the road. But here's the orders. Are you all right, Pete? Well, we're off."

The "93" picked up her twenty-four loads and started out of the yard.

"Phwat about the firin', sorr?" asked Pete of the Fourth Vice.

"Well, fire lightly, and don't close the door at first."

"Shall Oi putt in a foire now?"

"Well, yes, I suppose so; fire about as often as you do regularly."

Pete jumped for the shovel and fired in three or four scoops of fine coal; the black smoke rolled the second the door closed; the Fourth Vice glanced at the stack and spoke sharply to Pete:

"Open that door on the latch, sir; don't you see how the smoke is coming out?"

Pete opened it, waited a couple of minutes, then the Fourth Vice motioned with his hand to have it shut.

"That's the way to do it, my man; do you see there was no smoke at all?"

"Oi do, sorr, but she dropped foive pounds of stheam, do ye moind, and it's harder to git than to lose."

There was just the trace of a wrinkle on the brow of the Fourth Vice, as he glanced at the gauge.

"Shall Oi putt in another foire, sorr?"

"Yes, if it's time."

Pete chucked in three shovelfuls, well distributed, and the Fourth Vice watched the stack with joy—there was no smoke. Pete turned his shovel over and held it in the door for a second, looked up at the stack, and jumped for the tank, commencing to fire coal into the furnace like mad.

Skeevens was wrestling with the sandlever, for the "93" was slipping.

"Stop!" shouted the Fourth Vice, "are you crazy? you put in ten shovels of coal there at once; leave that door on the latch."

"But she jerked a hole in her foire, sorr."

"How's that—a hole in her fire?"

"In course, phwen he slipped her she histed the coal off the front av her grate, the foire wor too thin."

"She didn't throw smoke until you put in the fourth or fifth shovelful."

"Oi'm onto that, sorr; phwen there wor no smoke I knowed there wor a hole, an' all the draft wor goin' in there."

Skeevens kept himself busy and apparently paid no attention to the play on the deck.

The "93" lost another 5 pounds of fog.

The Fourth Vice, Pete and Skeevens each had a wrinkle on his brow now, and Skeevens looked at his watch, then at the steam gauge anxiously, whenever the Fourth Vice looked his way. This kind of anxiety is catching.

Pete left the door on the latch one-and-a-half minutes by the watch after every fire; fired as he was told, worried to see the steam go down, sweat like a butcher and wished the Fourth Vice was in Halifax.

Skeevens kept his eagle eye on the rail

and looked anxiously at his watch. Steam was down to 105 pounds, ten miles out, and at Peaksboro he was four minutes late and there was a red flag out.

"Please put Pete on to the way to use that blower and door to prevent smoke; there's an ordinance against it in this town," said Skeevens.

Skeevens went to the telegraph office for orders, and returned with this message:

"Report cause of delay to your train at once. J. E. B."

This he handed to the Fourth Vice.

"What's this for?"

"Bluff wants to know what has delayed us. We were four minutes late and he has held us six more to ask us a useless question; does it every day we get three minutes late."

"Don't pay any attention to him."

Skeevens jumped onto the engine, glanced at the gauge, and said:

"Pete, why in the devil didn't you blow her up and get her hot? She ain't gained a pound."

"The gintlemon said, kape the doure open and the wind-jamber on aisy loike."

It was hard starting with 105 pounds of steam, and when they got back to speed they were fifteen minutes behind time, and had to lay back one station for the Flyer. Skeevens pretended to be mad at Pete and raved about being disgraced; never was so late before. Why in the—couldn't he keep wind on the engine?

"Is it fog yer wantin', Misthur Skeevens?"

"Yes; here's a sixteen mile hill ahead of us, thirty minutes late, and no steam."

"Well, sor, Oi can fix ye out if ye will let me foire this kittle for stheam; but Oi am fairin' her now under instruchins fur shmoke, and yez can have yer chice."

"Well, get her hot anyway, now."

Pete shut the door, opened the blower wide and then fired in a half-dozen shovels of coal. She smoked, but the finger on the gauge commenced to crawl up toward a hundred and enough.

"Mr. Newe, don't you think that if we could get more oxygen to combine with the hydrogen over the fire that we could complete combustion better?" asked Skeevens.

"Well, I don't know but we could; but what we need is in"—

The Flyer went by here, and the Fourth Vice didn't finish, for the "93" was tugging at her train when the last sleeper passed. Pete and the Fourth Vice "fired her for smoke," and the "93" laid down half way up sixteen mile hill and had to be "blown up."

At Hilltop they got another sassy message about delay of train, and at Sumer-ton they were an hour and five minutes behind the schedule and had delayed most of the other trains on the road—the "93" hadn't done such a thing in years.

The coal dust and sweat mixed with the wrinkles on the brow of the Fourth Vice. As they were taking water at Springvale he asked Skeevers how much steam he needed to keep the train on time.

"One hundred and sixty."

"Do you generally have it?"

"Always."

"Why don't she keep it up now?"

"Oi can give yez a straight tip on that," said Pete, sliding into the pit.

"Well?"

"Foire her for stheam."

"Well, fire her for steam, then; we've got to get this train over the road some time," said the disgusted official.

"But she'll schmoke a little, sorr."

"Damn the smoke."

"That's what Oi say all along, sorr."

The Fourth Vice slid off and took No. 4 back to town.

Pete, the "93" and Skeevers finished the trip with 160, and, well, she did throw some smoke.

When they got home the next day there was a note for Skeevers to report to the general superintendent at once.

He reported.

"Old Calamity," as the boys called the general superintendent, was in a swearing rage.

"What's the matter with your engine, Skeevers?"

"Nothing at all, sir."

"How came it, then, you lost an hour and forty minutes yesterday, missed your connection, delayed half the trains on the road and raised hell in general?"

"Experimenting to save smoke."

"What right have you got to experiment all the trains on the road late, tell me that?"

"I wasn't doing the experimenting."

"Well, who was?"

"The fourth vice-president, sir."

"What in the name of the bald-headed Abraham does he know about smoke?"

"You saw the new bulletin about it didn't you?"

"No."

"Well, any engineer who can't burn soft coal with a forced draft at the rate of a hundred or two pounds per square foot of grate per hour without smoke is to be discharged."

"Who says so?"

"The fourth vi"—

"The fourth jackass."

"I asked him to show my fireman how to combine the hydrogen and oxide and the chloric and the carbolic and the debolic, so as to do away with smoke—and that was what was the matter with the '93' yesterday."

"She didn't steam?"

"Pete says she was fired for 'schmoke.'"

"Well, you make time, smoke or no smoke; I know you fellows make too much smoke around stations and can prevent it some; but you can't burn coal without some smoke any more than you can boil water without making steam."

"Well, what about the bulletin? There are already a lot of rules and orders in force that if obeyed would stop every train on the road. You officers know we have to disobey them to do our work, but if anything happens we were disobeying orders. Mr. Newe might just as well have ordered us to have burned no coal at all—it's one or the other, which shall it be; smoke, steam and time, or no smoke, no steam and no time?"

"That bulletin will come down and the man that put it up will take it down. I'm getting tired of this kindergarten railroad-ing."

"What about stopping a train that is three minutes late to ask what delayed it, and give it five minutes more in the neck?"

"It's bad business; they do that on the G. M. & T."

"They do it right here."

"Who the h—"

"Read that; ask Mr. Newe, he was with us," handing him the message received about delay.

"Look here, Skeevers; you knew how

this smoke business would come out, didn't you?"

"I could guess fairly well."

"What did you let this Newe go out to bother you for?"

"To teach him an object lesson."

"Well, what do you suppose he learned?"

"That you can figure out more about smoke preventing on a mahogany desk than you can show in practice and do the work at the same time. That it would be easy enough if all you had to do was to prevent the smoke, and that there was more cry than wool in this smoke nuisance howl, anyway. That what can be done with a big stationary boiler with natural draft, burning twenty pounds of coal per square foot of grate per hour, cannot be done on a locomotive burning more than a hundred, any more than a Corliss valve-gear will do on an express engine."

"Well?"

"You put up a request something like this and you will have little cause for complaint, and take down the old one."

Then Skeevers sat down and wrote out a bulletin:

"Considerable complaint comes from various towns about the throwing of heavy clouds of black smoke. The management of the road recognize the fact that the enginemen cannot burn coal without some smoke, but know that where they try, they can, in a large measure, prevent it in towns and villages by intelligent firing, the use of the door and blower.

"Away from towns smoke is of little consequence. Fire then so as to keep an even and full pressure of steam with the least fuel.

"Those firemen who are the most successful in preventing smoke at stations will be given the best engines to fire, and this record will not be forgotten when it becomes necessary to promote men.

"The company has no set rules or pet plans of firing, but leaves this to the judgment of the men on the engines; you will be judged by results, not by methods."

"Try that on 'em and see if you don't have less trouble."

"Old Calamity" put on his specs, read the order over twice and then said:

"That's worth trying, young man; it's worth trying, and damme if I don't think

you'd make a pretty good railroad official yourself."

"I think so, myself," said Skeevers, "but the president has no other daughters, and I'm married, anyway."



Doctor Skeevers' Sure Cure for Throttle Fever.

Jim Skeevers don't always confine his object lessons to the firemen. Sometimes he works one off on other engineers, the foreman, the master mechanic, or the superintendent, and he has been known to illustrate a point to the fourth vice-president.

One of Skeevers' object lessons converted an intolerable nuisance of a round-house foreman into a reasonable human being, and, if there is anything in the doctrine of perdition, saved the souls of a lot of men who were before prone to blaspheme every time they talked to the hereinbefore mentioned foreman.

This foreman was one of those restful mortals who make you feel satisfied with your lot, when you kick about cylinder packing that blows, valves that leak, or rods that pound, by telling you how much worse some other fellow's is—this helps yours so.

He was one of the kind that sneer at everything the engineers do on the road in an emergency, and tell what they ought to have done.

The kind that kick about giving orders for the little engine supplies as if they had to pay for 'em.

The kind that scratch off *all* the work put on the book if they do a little of it.

The kind who believe in "good enough" jobs.

The kind who are always wanting to get out on the road to run—and have never done any running, or firing, eyether.

Skeevers laid for Davidson for over a year, and finally got him. Davidson had been wanting to ride over the road with Skeevers the first Sunday that he went out in the morning. So he got him alone last Sunday. Skeevers was marked up for an extra freight at 8.40.

Skeevers' engine had been double-crewed all summer, on account of World's Fair business, and running repairs were

cut down half on account of the engine being out most of the time, and another half on account of the reduction of shop force and a 10-per-cent. encourager for shopmen to do as little as possible.

Skeevers don't kick much, as a rule, but when he reported "Right check ground in and cylinder packing down on the right side," trip before last, he felt sure the engine couldn't do her work much longer without it; but when Davidson told him he "ort to hear Jim Bishop's engine blow," and that "Baldy Bates' fireman got out on the running board with a pail of water and the coal pick every time he shut off the injector," Skeevers said that he hadn't noticed it, and perhaps the "618" was all right, after all, but she needed washing out awful bad, anyhow.

Davidson laughed. "Lord," said he, "Dave Keller's had the '96 'on the express for four months without washing. Dave is a good man with an ingin, you know," he added parenthetically, "machinist runner, too; he doesn't shut off on the road at all, jest run her on froth—soda water."

Skeevers was glad he was going to get that extra Sunday morning. It would surely be empty coal cars—about two more than the engine ought to have. He knew the road would be crowded with trains—there's no God on a Western railroad.

He knew Davidson would go out with him—and Skeevers smiled.

Skeevers called on the train dispatcher who would be on duty the next day, talked a few minutes, and—they laughed.

Skeevers hunted up Billy Woods, his conductor; they had a cigar, chatted a few minutes, then, well—they laughed real loud.

Davidson came down the next morning smiling—going to have a holiday. Skeevers got around later, got into his over-clothes and commenced to oil around; Billy Woods came by and gave them both a cigar, remarking to Skeevers that they were going to be four loads short of a full train (they had three too many), and that the "618" would just play with the train—sure to have a nice easy trip.

Pete Doyle had a cushion on his seat for the foreman, and let him have the window all to himself and be right in his way—Pete knew it wouldn't last all the trip or he'd have kicked lustily, and who could blame him?

As Skeevers dropped a little 13-cent oil on the well-worn bearings of his engine, Davidson followed him around, and Skeevers "jollied" him a little.

"Been runnin' you pretty hard lately, aint they, Skeevers?"

"Well, yes, tolerable; but then, you know, we get paid for it; I got in fifty-one days last month."

"Fifty-one, four times fifty-one, by George, that's \$204! The old man only gets \$150."

"Yes, but he's just a master mechanic, you know," said Skeevers in a pitying voice, which made Davidson's \$90 a month seem measly and small. "Pete gets almost as much as that. I've often wondered why you didn't go out runnin'—a man like you 'ort to be makin' decent pay—the idea of being tied down to a round-house is hard lines. Running is pleasanter, better paid and less responsibility, and, knowin' as much about engines as you do, you 'ort to get a great reputation on the road. Some of these ducks don't know no more about an engine than I do about preaching." Skeevers knew he tickled the governor in the right place there.

"Well, I shu'd say so. Why, Giles come in last night with the piston blocked wrong and the" —

"Here's your orders, Skeevers," said the conductor, and holding one, read:

"Run to Junction City extra. Trains 21 and 107 are abandoned. Don't pass Hope without orders. You may use fifty minutes on the time of No. 8, Cole conductor. Meet light engine, Smiles', east at Preston."

Skeevers and Davidson swung up into the cab, and, after comparing time with the conductor, the "618" commenced to cough and wheeze getting the train started. The packing in the right-hand cylinder roared lustily and, though Skeevers was used to it, he cocked his ear and pretended to listen—Davidson listened, too.

"When did you clean her nozzles, Skeevers?"

"Yesterday."

"Got a funny sound in one; guess the tip is loose on the stand."

"Nozzles be damned," said Pete Doyle, "thot's one ave the jobs Skeevers has asked youse for the doin' these many

times; avery turn ave her wheels means a shovelful of coal for mesel' to sling. I never heard cylinder packin' blow the equil ave that."

"That ain't her packin', is it Skeevers?"

"Yes, but that's nothing—you ort to hear it blow on Jim Bishop's engine!"

Then he whistled for a road crossing to keep Davidson from answering.

They were not ten miles from home when they had to stop for a hot pin on the left side.

"Maybe you've got her keyed too tight," suggested Davidson.

"No, it's the main rod, and it pounds itself hot."

They looked at it, and, sure enough, it was awful loose on the pin. Davidson offered to file it right there, and promised to do it in ten minutes. Skeevers led him on, looked at his watch, and said if it could be done in fifteen minutes it would be all right.

They had to cool the pin and strap, then take it down. Skeevers had a file, but no tools except the regulation set, and they had trouble in getting the strap off the rod, and more trouble to get the back half of the brass out. Then there was no place to hold it, and nothing to square the brasses by or with. Davidson had his store clothes greasy by this time, and was in a good sweat, hard at work, when the conductor came up and wanted to know why in the blankety-blank they didn't overhaul the engines in the shop, looked anxiously at his watch, ordered the head brakeman to run and flag No. 2 (which wasn't due for an hour), and made a howl in general.

When the main rod was up again they had not time to make the next town for No. 2, so they backed up and headed in. When they got to the next telegraph station there was a fierce message about the hour and forty minutes' delay.

Skeevers wrote a bland explanatory message, and the reply came over the wire that whoever caused that delay would hear from *me* on Monday. This was signed by the superintendent, and it made Davidson very ill at ease.

The next twenty-eight miles was level or slightly down grade, and Skeevers seduced Davidson over to his side, and finally got him on his seat and hold of the throttle. This was all very nice for half

an hour, and Davidson was getting a little confidence in himself.

Skeevers went over on Pete's side and sat down, and in going had hooked the cab door behind the new runner.

The "618" commenced to work water, and Skeevers remarked that she was full and the injector had better be shut off.

Davidson shut it off. The check stuck up, there was a growl, and in just one second the boiler of the "618" commenced to blow off through the overflow of that injector, and the new engineer was trying to get out of the side window. Skeevers was there and stopped him.

"It's the check stuck up," he yelled; "go out on the running board and pound it. I'll hand you a pail of water."

Davidson got a shower bath getting by that overflow, for he didn't think to shut it and let her blow into the tank—he'd thought of that in the shop.

When he was half way out to the check Pete pulled the whistle open, and he came back in a hurry and shut the throttle. Then Skeevers opened it as he handed out a pail of water. Davidson dodged back again, thinking it had worked open. Finally he hammered and cooled the check into taking his seat.

Davidson was wringing the water out of his vest and swearing, when Skeevers made it all right—he told him about Baldy Bates' engine, and how *her* check stuck.

Davidson made up his mind to get back on the fireman's side. But when he looked around for Skeevers, he was back on the first box car, with his legs hanging over the side talking to the brakeman, and Davidson had to "keep her going."

Pete watched his chance, and when Davidson whistled he started the left-hand injector—it was level and easy for the next two hours' run, and Davidson never thought of the injector again.

Presently Skeevers came over, and the first thing he asked was if the check stuck up again.

"No; ain't used it."

"How's your water?"

Davidson's face was ashy white in an instant, and his hand trembled as he reached for the lower gauge-cock; it reddened when he found water.

"Haven't you put any water in her for the last two hours?"

"Not a drop—she don't use much, does she?"

"Misther Skeevers," said Pete, "it's mesel youse can thank for the wather. The boss av the roundhouse is hell on runnin' engines as is standin' still—if Pate Doyle hadn't put on his squirt, youse wud a had the mud ring melted against now."

Davidson tried the gauge-cocks every two minutes the rest of the day.

When they stopped at Slocum for water, Skeevers found use for the soft hammer, and asked Pete for it.

Pete looked all through the box and reported a drouth of soft hammers.

"Oh! it's there. I saw Davidson get it to pound that check."

"In coarse, ye did, sorr, and he left it on the runnin' board and it's jiggled off entirely."

"And it's lost."

"Gone till the devil, and it's himself as stud up on his hoind legs and cursed me, Pate Doyle, for bein' thot kerless as to drap aff the lasht one. He sed he'd never give you nor me another saft hammer so long as the Lord left him wind to breed wid."

Davidson couldn't help hearing; but he laughed and said he'd give Pete an order for a new one.

Skeevers gave Davidson his orders, made him read them, and told him to go ahead—he was going back to the caboose.

Just as they struck Hope yard, Pete slyly let down the right tank valve, gave the lazy cock of his injector a quiet kick, and it broke. He told Davidson that his injector was "kicking up" and that he'd better start his own. Davidson tried. The more he tried the more excited he got. Pete told him to unhook the door, and he would show him how to start it. This was humiliating. Of course, it started all right for Pete.

They were sailing right through the little town, when, all at once, the emergency went on (from the rear), and as Davidson pulled his head out of the front sash he looked back, and the conductor, Skeevers and both brakemen were flopping their wings like windmills.

"Are ye tryin' to kill everybody, ye crazy loon?" yelled the front brakeman. "Gimme a red flag, quick, Pete."

Skeevers came over on a run, and push-

ing poor Davidson out of the way, backed the engine inside of the switch limits.

"What's up, for God's sake?" asked Davidson.

"Up? Why didn't you read them orders: '*Don't pass Hope without orders!*' It's a sure discharge for going by a 'do not,' besides we might a had a collision."

Davidson got over on Pete's side, and Skeevers had to run her in, and they got along all right.

At the end of the road they got supper, and Skeevers proposed a walk around town before they went to bed; but the caller came for them before they could get away, and at nine o'clock the "618" was hooked onto a row of freight cars up in the big yard.

Skeevers got Davidson on his side to "learn him the yard," and with all the switch lights and switch engines dodging out and in, and the signals from three crews, the whistling and answering whistles, Davidson was a little muddled. Maybe Skeevers made some extra moves, got some extra signals, and did some extra whistling, but it all served to mystify Mr. Davidson and to increase his respect for the engineer who understood it all and was so cool about it.

That night, going down, Davidson learned that he couldn't handle automatic air nearly so well on an engine and a grade as he could in the roundhouse.

He learned how pleasant it was to put the reverse lever down in the corner, and skin the knuckles in doing it.

He learned how much it helped to keep one awake by putting a red hot steam-pipe just under the throttle-lever—just where the wrist will touch if the arm is allowed to sink a sixty-fourth.

It rained, and he learned something about handling a big train in bad weather on both sides of a hill.

Skeevers illustrated in several ways, without saying so, that it is impossible for an engineer to do much "keeping up" of his engine on the road and handle his train on time.

Davidson was nervous about fires along the track until passed; he got excited over some horses that got on the track and got hit.

He learned what it was to "hustle" and be "hustled" by every man with authority to send a message.

He learned what it was to stay on a freight engine for twenty-four hours without rest, and without a lunch pail. Skeev-
ers longed to make it thirty-six, and then tell him that Swifty Wilson once ran fifty-four hours without rest—always sprung on a man who kicked about *doubling* the third time.

At Junction City Skeevers went into the office for orders, and asked Davidson to "make a switch" for him. The crew got him into a cut-off with forty red lights in sight, all of them made signals at once, both ponies whistled at him, the check stuck up, and he burnt his hand all at once—and backed off a switch to boot.

He was down with his lantern looking at his "luck," all the switchmen were cursing the air blue, and the "618" was blowing off wildly when the conductor came down with an order for him to run engine "618" into the terminal, as Skeevers was wanted to run Carlton's engine west; Carlton was sick.

Davidson's heart was faint when he thought of the eighteen miles of down hill ahead of him, and that pesky automatic that he knew so well how to *tell* others to use, but could not seem to *show* the how very successfully; besides that the "618" was off the track.

He was more at home getting her on than running her. He looked her over carefully and yelled up to Pete to bring the "blockin'."

"We ha'nt got no blockin'."

"Well, get out the jacks."

"They've all been took off, sorr."

"Say, neighbor," said the conductor, "do you think we've got time to raise this engine up on jacks. She's blockin' the main line. Git up there, Pete, and when I say 'when' give her the tit."

He ran around the engine, threw in a couple of links here and there, a piece of wood or so and—said the "when."

Pete pulled her open; there was a great fuss and wiggle and slip and shake—but she got on all O. K.

"That's the way to do business—on the road," said the con.

They got home at last. Davidson sent word to the roundhouse that he wasn't able to come down, and went to bed, but he asked that the "618" lay in and have work already reported done.

The next day as Skeevers was packing

the throttle a helper, working on the rods, struck Davidson for a job of firing.

"You're a fool, young feller," said Da-
vidson, "why don't you finish your trade?"

"The firemen make more money than most of the machinists do. I've worked three years at it now, and that ought to help me about gettin' promoted."

"Well, they earn it. Why, confound it, man, they don't eat regular, nor sleep any to mention; and as for your machinist experience helpin' you, why, it ain't worth a damn. They ain't supposed to repair engines on the road, and any fireman on the division can give *me* points about fixing up a breakdown. Running an engine is a separate trade, sir, a separate business. An engineer don't know much about putting in springs and facing valves; but don't think he don't know nothin'. There's just as much difference between the machinist trade and engine-running as there is between diamond-cutting and sausage-stuffing. Why, I wouldn't run the best engine this company's got for fifty dollars a day. It takes a different kind of a man from me, or you either. You go on and line them guides, and thank the Lord you ain't gettin' four dollars a day on an engine, and earning twelve."



An Object Lesson on Jim Skeevers.

Skinny Skeevers has had a hard row to hoe this last year—he's been roundhouse foreman.

Skeevers has been trying for eight mortal months to find out whether he is an "official" or just "one of the hands," and he don't know yet.

He had hardly had time to warm the seat in his little office near "the board" when the company cut the pay ten per cent.—kind o' sudden, like.

Skinny had been in one strike, and, being a student of the times, concluded in just thirty seconds by the watch that he didn't mind about the nine dollars the cut took off his monthly check—but he had trouble about it.

The runners commenced to be careless about their work, and reported lots of it that they formerly did themselves. Skinny kept after the roundhouse force with a sharp stick, and was just about keeping his head level, when the company ordered the shop force reduced twenty per cent.—Skeevers asked for his run again.

The Old Man refused.

Skinny thought great gobs of think. He concluded to shame the runners into doing something. "Jim Loftus," said he, "you don't want the reputation of running as expensive as Crazy Horse Hays. Now, look here; last month your running repairs were higher than Hays' and almost double what they were the same month last year. Now you've reported a set-screw put in the front end of your main rod; a machinist will charge up an hour on the '318' for that. Why don't you go into the back shop and get a set-screw and put it in yourself, like you used to?"

"Company pays for puttin' that set-screw in, don't it, Skeevers?"

"Yes, but man!"—

"All right, Skinny, me boy, if the company kicks about it, tell 'em I'll pay for the time—they ken jest take it out o' the ten per cent. they took out o' me!"

Skeevers couldn't argue much against that kind of logic. He found the stove committee in a hot discussion, and tried a little reasoning of the general managerial order.

"You fellows know, just as well as I do, that the company is in a hole," said he, "they are losing money hand over fist, and I say it's no more than fair that the men stand some share of it—don't they promise to restore the wages when times pick up?"

"Have you got any notes in your diaree showin' as how the company divided up with the men year before last when we had five months of a coal rush? You know they had a bulge on the price and the freight. What's sass for the rooster is good enough dessert for the hen. Them's my sentiments!" This from Hen. Jorge, one of the oldest and best men on the road.

"Youst you vate," said Otto Dietrich, the socialist member, "undil ve 'ged dot co-oberadive com"—

"Right ye air, Dutchy," said Hank Bitters, "when we git to heaven 'there'll be no sorrer there.' In the meantime I set up no more wedges till they pay me three-eighty-five for a hundred miles, see!"

The strike fever got epidemic. Some of Skeevers' men were exposed, and it broke out among the firemen. Dirty Evans refused to wipe off the "113," and Skeevers advised him to go into the fertilizer business—and gave him his time.

Then the whole lay-out took their time—to go out.

The master mechanic ordered Skeevers to send out wipers, helpers and pumpkin huskers from the four corners of the earth to fire engines.

The boilers had chills, the trains were late—and Skeevers got red-hot letters from the trainmaster.

Skeevers had smoke coming out of 48 per cent. of his mills when the engineers concluded that it wasn't safe to run the engines.

The master mechanic undertook to make up No. 8, and got the "321" off a short rail—then he ordered Skeevers to make it up.

The chairman of the committee told Skeevers he'd be expelled if he did. The master mechanic said he'd be fired if he didn't. Skinny compromised by making

up half the train, and then getting off the track himself.

The superintendent said Skeevers was too much in sympathy with "the rest of the men."

The old-timers said they could win if it wa'n't for "officials" like Skinny Skeevers doin' "men's work."

After the trouble was over the men who got back said: "Skeevers was just as nice an 'official' as they ever worked for." Those who didn't get back called him a "scab."

Skeevers had his tin wedding last month, and the general manager sent him a mantel clock "for faithful and efficient service during the recent labor troubles," and the Knights of Labor sent him a set of engrossed resolutions thanking him for "demonstrating his fealty to the cause of labor in the recent upheaval."

Skeevers is muddled for once in his life, and don't just know where he stands. He stated the case at great length to his wife on Sunday last, and asked for an expert opinion—she was alarmed.

"Why, bless my soul, James Skeevers," said she, "what's a-goin' to happen? This is the first time in my life I ever saw or heard of a thing you couldn't squirm around into one of your infernal object lessons. This is one of 'em, I know; but I can't for the life of me see where it comes in—but you ought to. There's something the matter with your liver, or digestion, or something. Lie right down, dear, and I'll make you some ginger tea—what you want is a good sweat."



A Few Object Lessons by Jim Skeev- ers—and One by His Wife.

Jim Skeevers made some reforms in the roundhouse, if he didn't find out whether he was an "official" or "one of the hands."

Skeevers' roundhouse is a big one, at a point where three divisions end—the north, the middle and the Granger branch. It's funny how some things about railroads get their names—the Granger "branch" is longer and runs more trains than the three main-line divisions put together.

When Skeevers took hold the Old Man told him that he'd like to see an improvement, but didn't expect it. Blithers was a good man, and it was a mean, low-down trick for the Midland to offer him more money for a smaller job.

Skeevers had never run into Granger regular, and didn't know much about the roundhouse, but after looking around he made up his mind to one thing, and that was to clean up a little.

There were piles of scrap everywhere, worn-out air pumps and injectors, and lubricators were piled around under the benches, with old boots and discarded overclothes as companions.

A fringe of broken castings lined the battlements of the cinder dump, and between the roundhouse doors, facing the turntable, the thoughtful and foresighted Blithers had for years stored up partly worn castings that "would come in handy some day for repairs."

Consternation reigned when "the new boss" ordered all this loaded on flat cars, and shipped all the scrap, good, bad and indifferent, to the main shop.

Brass scrap was hauled out from under benches and ruthlessly ordered away.

The old carpenter, who put in cab windows and repaired pilots, was put to work making cupboards "two feet wide and deep and seven feet high," one for each mechanic and helper in the house.

Skeevers ordered every man to put

what he valued as personal belongings in that cupboard, and ordered the sweepers to gather up all the old shoes, and overcoats, and hats, and traps, and put them in the cinder cars—and to take everything not in the cupboards.

The traveling engineer—a fossil who kept his job by virtue of his age and a hold he had in a judgment for a broken leg—came down on Skeevers here and remonstrated. Skeevers called up the machinists one by one, and asked them if they ever remembered repairing a broken-down engine with any parts off the select and sacred scrap piles between the doors.

None of them had.

"That's an object lesson for ye, Rory," said Skeevers. "Tons of that iron ought to have been melted up years ago; a little blacksmith work and bolt-cutter work will make lots of it useful, but I can't do it here with only ten men and seventy odd engines to keep going."

"Well, Skinny, I don't like them clothes coffins; they cost something, take up some room and make the men feel sort o' like they was in prison; no nachurel freedom"—

"A man that ain't clean enough to want to put his clothes in a clean box in a dirty shop ought to be in prison; the place used to look like a boar's nest around every bench," answered Skeevers.

Skeevers had clean cinders put between the turntable tracks, and raked even and level, and the whole yard cleaned up in the same way, before the Old Man visited him.

"It looks nice, Skeevers," said he, "but it would cost \$50 a day to keep it so."

"A laborer at \$1.10 a day will keep it clean, and sweep half the house beside. You see, sir, it's an object lesson in itself; it's clean, and no one will think of throwing anything dirty there—why, if a pair of old overalls or a broken brake beam was thrown out there you couldn't see anything else; the men keep it clean because it is clean."

"Mebby that's so," said the Old Man thoughtfully; "if it don't cost no more than that you might try it for a while."

Skeevers "requisitioned" nine barrels of lime three straight months in succession to whitewash the shop, but it never came. When he spoke to the traveling engineer about it, Rory told him that the shop had

been built eleven years and never needed whitewashing, and he reckoned the Old Man was right in refusing to go to the expense.

Skeevers bought a pailful of lime and painted a big white cross on the shop wall, right opposite the door. It stood out of the surrounding gloom like an honest man in Congress, and everybody noticed it and thought that Skeevers must be getting religious. Six weeks after, the general officers came down on a tour of inspection, and the general manager started when he saw the cross.

"What the devil is that?" was the pious remark he made.

"An object lesson," said Skeevers.

A light began to dawn in the mind of the general master mechanic, and he was half mad.

"Who's that object lesson intended for, sir?"

"Myself," said Skeevers. "I wanted to whitewash and couldn't get the lime, so I bought a quarter's worth and painted that to see if I could notice the difference."

"Why couldn't you get lime?" asked the G. M.

"I cut off the requisition," explained the G. M. M., "on account of expense—not the expense of the lime so much as the whitewashers."

"If you give me the lime I'll do the washing with a laborer and an air hose without a cent of extra expense."

Skeevers got his lime.

The Granger roundhouse was built with the promise of putting big shops there, but the company wasn't just ready yet, and they decided to use five stalls on one end of the big roundhouse as a back shop "temporarily." Alas! like other "temporary" shops, it was destined to be the permanent one, and the "big shops" live and die in blueprints.

When they put up the partition on those five stalls, ten years ago, the general master mechanic decided to use a large stationary engine he had rebuilt after the car-shop fire at headquarters. It was one of those old, sleepy, plain slide-valve affairs, with a 16-inch bore and a 36-inch stroke, with a flywheel 14 feet in diameter and weighing 9 tons. It occupied the place of one pit, took lots of room, used lots of steam and made 21 strokes per minute.

Every tool and every man in the place worked in perfect unison with the moving power.

The big boiler house—to be—was planned to stand where the cinder pile was now, and being yet in the blueprint stage, they put up a good, 50-inch shell, upright boiler in a corner of the shop to furnish steam for the Jonah that stood in the center.

The "shop" consisted of the big engine, four pits, three lathes, a shaper, a drill press, a wheel lathe and a grindstone, and Skeevvers figured that under proper conditions the big engine could run forty-six shops like that and never sweat a hair.

He walked through this place daily for four months noting the peaceful effect it had on everything; the men talked slow and walked slow and worked slower; his own pulse dropped the minute the door was shut on the rushing sound of blowing-off steam in the roundhouse, and he felt drowsy and dreamy and lazy—but Skeevvers was thinking.

Out in the yard stood an abandoned steam shovel that had been in a wreck; Skeevvers surveyed her, and rescued a little engine from her interior, and had it taken to the shop.

This little engine only had a 7x10 cylinder, but it had an amazing hustle between the governor and the piston somewhere. Skeevvers set it up near the boiler and piped it up one Sunday. The men thought he was going to use it to pump water into the boiler.

Skeevvers figured on its speed, and got a big pulley for the main shaft. He put on the belt Saturday noon and, lo! the little engine carried the work just as easily as if designed for the place; but her little piston was hopping back and forth in the cylinder 261 hops a minute.

Sunday, Skeevvers had a gang of men there. They skidded the old engine out back of the shop, tore up her foundation and put rails back on the much-needed pit.

From that day on there was a perceptible improvement in the time and motion of that shop.

Last Tuesday week the general officers were again on their rounds. The G. M. had admired the clean walls of the house for the hundredth time, approved of the new doors with the big windows, said the moving of the smoke jacks so as to

"head" the engines in was an inspiration, and many other compliments, when he suddenly turned to Skeevvers and asked:

"Any more of them object lessons around handy?"

"Well, yes," said Skeevvers, "come out in the shop."

When they went in, a fifth engine was on blocks getting her tires turned. The little monitor near the boiler tapped a quick waltz time; the boiler-maker, in a firebox, was trying to keep up the stroke—and was a little behind. Every tool was on a higher feed than it had ever known; the men stepped quickly. Dave Turner was putting a lathe dog on another piece of work, so as to clap it right into his machine, and save time after the present cut. A man outside was washing the windows with a swipe of his long brush that indicated that he didn't intend to make a winter's job of it. In fact, things seemed to hum.

"Well, I'm damned," said the pious G. M., "this here is an object lesson. Say, Mr. Skeevvers, how do you account for this 'git-up-and-git' here—you've got the same men and the same tools?"

"Yes, sir, but another prime mover. The way I figure it is this—a man cannot be much better than his surroundings. Give a machinist a nice new lathe in a dirty, foul, dark shop, and the angel of death couldn't make that man keep that tool clean long—in a clean shop he wouldn't think of letting it get dirty. It's the same way with engineers. Give the best engineer in the land a dirty, rickety, badly cared-for engine, and you will soon have a dirty, rickety, careless engineer, and dirty, rickety, careless work. Herd men with swine and they will soon become hogs. On the other hand, surround men with comforts, cleanliness and order and their service becomes like their surroundings and their lives like their work. Order and cleanliness save time and money, for it is easier and quicker to do a thing right than to do it wrong. That more work can be done is proven right here. We rebuilt the last five engines in just one day more than it formerly took to rebuild four, and this five will be gotten out in the same time. I have never said a word to a man, either; I just gave 'em an object lesson with the engine and the whitewash."

"There's one object lesson we've overlooked ourselves, John," said the G. M., turning to the G. M. M., "and that's Mr. Skeevers' ability. Now, if I was general master mechanic of this road and couldn't find any other way to move the corpse you have in charge of the main shop, why, I'd promote him and slam in a—well, say an object lesson."

Saturday there was a bulletin notice that James Skeevers was hereby appointed general foreman of the entire road, vice Amos Slocum, promoted.

Skeevers took the notice home and showed it to his wife.

"Sairy," said he, proudly, "there's an object lesson for you—shows what a little git-up-and-git will do for a man."

Sarah read it through carefully, looked up at Skinny through those cool gray eyes of hers and said: "James Skeevers, you're the dearest old fool on the whole road; can't you see an object lesson *in advance*? Don't you know that John Massey was a no-good mechanic, and that he got to be general master mechanic by accident, and that he's a twenty-two caliber—a little scant—and jealous of every man under him that shows ability above his own? Don't you see that the general manager has forced his hand in this matter, and can't you understand that when he gets you into the big shop that he'll make things very interestin' for you? Why, James Skeevers, he'll have your hide hung on the shop wall as an example of a man who knew too much! You mark my words!"



Jim Skeevers Takes an Object Lesson Himself—Tool Grinder and Oil Economy—A Visit From the Old Man.

Jim Skeevers had been general foreman of the main shops just one month to a day when the general manager came up to see what was going on. He is quite interested in Skeevers' way of doing things.

Skeevers and the G. M. walked through the shop.

"I can't see much improvement, Mr. Skeevers," said he, "'pears to me things are going along at about the same old jog, devilish slow. I kinder looked for some reforms by this time, one of your what-de-call-'ems—oh, object lesions."

"Object lessons are not all of one kind, nor is the same one perceptible to all men. I have used a big one of myself since I came here, and it's done the road lots of good and saved some money."

"How's that?"

"Well, I came up here determined to make a show. I had not been in the shop two days before I had figured out ten changes in the shop, marked two or three drones for dismissal, spotted two apprentices for promotion, and contemplated changes that would cost the company some thousands of dollars. I had it all down pat, made up my mind—and dropped it all in 15 minutes."

"What made you change your mind?"

"Your quarterly statement and a scrap of paper."

"Well, well."

"I went home that night and got mad at Sairy for tearing one of my back number copies of *Locomotive Engineering* to put on a closet shelf. While I was hunting for the place to patch it up I read part of an old editorial on 'What not to do'—then I read the quarterly statement in my daily paper. I made up my mind then and there to go slow. In the first place, the road is not earning anything above operat-

ing expenses and fixed charges; there is no business to *make* from; if it comes out ahead it must save the amount—I am going to try to *save* something."

"That's good, that's good; but what about the piece in the paper?"

"Well, I can't say it off to you, but it was something like this: 'When you are promoted don't think your reputation depends on how many changes you can make. Look around, study conditions, cause and effect, and perhaps you will find a reason why some things are different than you would advise or expect. A fairly well organized place will run itself for a while; you simply get aboard and ride, but keep your eyes open. Never make a reform or change except for economy, safety or increased efficiency—never for the mere sake of change. A manager's success depends very much more on what he *does not* do than upon what he *does'*—and so forth. That made me drop several things I had in mind."

"Well, what?"

"I had made up my mind to dispense with the services of that white-headed old reprobate there, in the link gang. He is off three days after every pay day on a drunk; he is lazy and slow and quarrelsome—spends more time in nagging apprentices than in doing work. But I found out that he is the only man in the place that can set valves. Slocum and he came from the same shop; they believed in keeping trade secrets, and out of nearly a hundred machinists, mostly made here, not one can set valves, or at least none have had experience. There's going to be a revolution over it; but if I don't have ten men setting valves here in a month my name ain't Skeevvers—that change is deferred.

"I made up my mind to move that big wheel lathe to the other end of the shop, where the engine pits are, and save rolling every pair of drivers the whole length of the shop—but I found that at that end of the shop was located the out-of-date fire pit for heating tires, and most of the wheels have to go up there anyway. I was for moving the fire pit, but found out that it affected our insurance rate—that old wooden car shop is so near. I'll rig up an oil or gas burner and take those tires off in the shop pretty soon; then will be the time to move the lathe and save hauling wheels so far.

"That's only a sample. I have in hand now a little change that I figure would increase our capacity at least a third; it won't cost a cent, but I expect it will be hard to bring about—no precedent for it."

"Damn the precedent; if it don't cost anything, let's have it. What is it, anyway?"

"You would have gotten a letter about it from the general master mechanic before now, but you know he has gone East on account of a death in the family."

"Well, you explain what *you* want; maybe John won't recommend just what you do. I want to know which is best."

"What would you say if I asked for one new tool to cost, say, \$1,200?"

"Under the circumstances, Mr. Skeevvers, I'd have to"—

"You'd cut it off the requisition; that's what I thought. You are like all other managers. You don't want any money spent for betterment in times like these. Well, suppose I asked for twenty-five more machinists; we need 'em and"—

"Now, Skeevvers, you know we can't think of it for a minute."

"Yes, I know. You and the directors look at the pay-roll when you want to cut down. You won't buy a new tool now, but I have a plan to get the new tool and the extra men without expense—listen:

"This road hasn't bought a new tool in ten years; but the shop management had to have some, so they made 'em. They ain't so good as boughten tools and really cost more, but they did not appear in the requisitions nor in the pay-roll—all charged to repairs.

"The manager before you encouraged the plan of 'making things ourselves,' and when this new shop was equipped they bought a shafting lathe and a pulley lathe—there they are. We can't use either of them ten days a year on our own work, and if it wasn't for doing outside work for Davis they'd be still most of the time. Davis needs those tools and is willing to pay a fair price for 'em. I want to sell 'em both and buy a tool grinder."

"What's the matter with the grindstone and all them emery wheels around the place?—seems to me a tool grinder is a refinement for manufacturing places."

"Just come up into my office. There, now, you see we are in the center of the shop and 6 feet above the floor. You can

see every tool. Now, look down that double line of lathes—how many are idle?"

"One, two, three, four—seven. Seven standing still! Why's that, Skeevers?"

"Well, you see one man is setting his work; that's all right. The others are idle because the men have gone to the blacksmith shop to get their tools dressed, or are at the stone grinding them. If I had a tool grinder I'd stop every man from going to the blacksmith for peculiar shapes and temper. I'd stop high-pay men from standing around the grindstone, and we would buy but six sizes of steel instead of seventeen. I'd put the grinder in the tool room; one good man would grind every tool in the shop for lathes, planers, shapers, drill presses, etc., and there would be no pet shapes or pet tempers."

"Yes; but the men would stop their tools and go to the tool room for 'em."

"No, they wouldn't. I'd have two sets of tools delivered to each man every day. I'd arrange a call bell in each aisle, so that any man could send for any tool he needed and a boy would do the running."

"Yes, and the men would kick; maybe strike."

"No, they wouldn't; nine out of ten men want to do the right thing. They are willing to keep their tools going, but there is no other way now than the way they do. Some of the old-timers will cry for their pet clearance, or rake, or something; but when one and all do their work with standard shapes—all will that stay—I figure we could do a third more work. I want to get the row of cripples in the graveyard track reduced; but with 20 per cent. of the men off and the rest working eight hours five days a week, it's slow. We've got to save time and expense somewhere, and I don't know how to do it any easier. Do you?"

"Say, Skeevers, have you got a telephone?"

"Yes."

"Ask Davis what he'll give, spot cash, for them tools."

Davis named a price, Skeevers repeated it to the Old Man, and he replied:

"Take him up, and tell him to come up and get 'em right off. Gimme that address and what you want, and I'll telegraph for the tool grinder to-night. You had an object lesson, as you call 'em, on tap, after all. Well, I must be goin'. Let

me know how the grinder goes. I'll send an order for you to deliver them tools to Davis. That'll keep you straight with John. Oh! by thunder! I almost forgot what I came up for. Got a notice from the engineers that the grief committee was going to call on me to-morrow about Murray's case—what do you know about it?"

"Nothing officially, but I do know what he was suspended for, and have an opinion on the decision, for all that. I'm not representing the department now, mind you, but speaking as James Skeevers to the general manager. Jack Murray is as good an engineer as you have; he burned off an eccentric on the '18' last week and cut a driving axle. I heard he got thirty days."

"What made him let 'em get hot?"

"Economy of oil for the mechanical department on one side, and an ambition of the management to run an Empire State express on a sand-ballast road."

"Economy of oil, hey; some of these fellers use too much oil—altogether too much."

"Yes, sir. Economy—so called—made Jack try to keep inside his limit. His engine was new and snug, and the time fast. Allow me to observe, perhaps you never thought of it, but did it ever occur to you that it was impossible to *use* too much oil on a locomotive?"

"Great Scott! man, there's enough on the platform down at the depot to run the road a week!"

"Ah! but that was not *used*, it was wasted. All the oil you can use is better for the engine and more economical for the road; but oil on the outside is wasted money. Every bearing ought to be *flooded* with oil at some part of its movement."

"Maybe that's so, but everybody is saving oil, and we are using more than double what some of our neighbors were. I started that oil-saving scheme myself."

"I know it; it's the style, and we must be in style, cost what it may. We did *waste* too much oil, and some of it needed saving; but the road would have been money in pocket if there had never been any row made about it. A little quiet work by a live traveling engineer would have cut down the *waste*—for, as I said, the more you use the better."

"Did it ever occur to you, sir," continued Skeevers, "that you could save more money in a minute by watching the

coal pile than you could save in a week by measuring out the oil by the thimbleful? I was looking the matter up last night. Our performance sheet—awful lot of guessing, by the way—shows that of the three men on the flyer, Barney Conners is the slickest man on oil, then comes Murray, then Sandy Macdonald. Sandy used over twice as much oil last month as Barney did—probably didn't steal any—but he ran the same train the same number of trips with nineteen less tons of coal. Let's see. You count coal worth \$3 on the engine—three times nineteen is fifty-seven—now, which of these two men is the best for the company?"

"No two ways of looking at that, Skeevers."

"Yet the head of this department put up Barney's name as the most economical runner on the road, and gave him a nickel-plated oil can—with Globe sights on it. It was such a reputation that Murray covetted, and that cost us the use of the "18" for eight days and \$110 for repairs. Sandy is making double time now, and you can bet he won't get anything hot for want of oil—he wastes some, never does know when a cup is full until it runs over, but he can be cured of that."

"Then, if you was me, you'd put Murray back to work?"

"Yes, and pay him for the time he has lost."

"I don't know about that."

"Well, the man is either to blame or not to blame. If he is blameless, he deserves his full pay; if not to blame, let him stay off his thirty days."

"Well, you send him out on his run. I guess you're right."

"Thanks, for Murray; but you think about that coal saving, and for the Lord's sake let up on the oil famine, or we'll have the graveyard so full of engines with cut bearings, broken eccentrics and burnt pins that we'll have to borrow power to haul our mail trains. Goodbye, sir."



**Jim Skeevers has Some Object Lessons Not All of His Own Make
—Shop Petitions—Painting Tools—Selected Scrap.**

Jim Skeevers has his tool grinder; the boiler shop has the big grindstone; the blacksmith shop has only one fire on tool dressing; the men have the tools delivered to them; the lathes have more work to do—and the general master mechanic has a petition for Skeevers' removal as general foreman, signed by 97 per cent. of the men employed.

The worst of it was that the petition was circulated and signed before Skeevers knew a word about it. This, of all things, on Skinny Skeevers, who had the reputation over the whole road for "getting onto things."

Skeevers dropped into the tool room for the tenth time to admire the new tool grinder in the hands of Hiram Eddy, one of the oldest and steadiest hands in the shop.

Hiram sawed wood steadily until the other man in the room went out for something, then turning to Skeevers, he said:

"Mr. Skeevers, I never got a chance to half thank you for picking out this nice easy job for me in my old age. I've run that big wheel lathe for twelve year, and was gettin' to notice the liftin'. It amounts to more to me than you think, and—well, seein' you've done something for me, I'd like to do something for you, and I reckon I can. When it comes to a show down on this petition you can count on Hiram Eddy, that's all, and damme if I don't"—

"What petition is that, Hiram?"

"Didn't ye know they'd all signed a paper to have ye discharged? The devil you didn't. Well, they have."

"What for?"

"That's it; there ain't a darned one of 'em can tell. You bet they left me out, but they as't my boy Johnnie there, him as

runs the radial drill, and he told me this noon."

"Who signed it?"

"All but eight; me and Johnnie's two, and I reckon you could name the other six—they are the best men in the shop. I told Johnnie you'd nip it in the bud; but, Mr. Skeevens, there ain't no bud—they took it to the old man last night."

"Say, Hiram, do me a favor and don't mention that you told me about"—

"God love ye, man; I was goin' to ask ye the very same—one of my mottoes is never to go out gunnin' for trouble; but if trouble comes to ye, why, make it red hot for that ere trouble!"

"Much obliged, Hiram; I guess it won't amount to much. I tried to do the square thing here by the men and the company. It takes two to make a bargain; the men don't seem to want the square thing; if the company is of the same mind, why, I'll move."

Skeevens went back to his office soberly. He noticed some pantomime performances among the men that would have passed unnoticed ordinarily, and after fifteen minutes of thinking over the subject he mentally resolved to let the shops of the Great Air Line go to the devil, put on his coat and went home at 4:30—something unheard of since he took charge.

Sarah Skeevens put down her work; she was constructing a new pair of pants for Skeevens Junior out of an old pair of "Skinny's"—rebuilding a mogul into a switcher, Skeevens called it.

"Well, papa, what brings you home so nice and early?" Mrs. Skeevens always addressed her lord and master according to her mood and the impression she wished to convey to the soul of the man she loved best. Her salutation when she knew he was tired, ill or worried, or when the children were ill or wanted something she thought they deserved, was always "Papa"—she might as well have added, "tell me, I want to help you; can't I do something?"—sympathy. It was "pa" when all was well at home and away; "James" for sympathetic seriousness; and "James Skeevens," with square, sharp corners, when she wanted to be severe, to reprimand or impress. One glance at Skeevens' face, and her work went down and her lips said, "Well, papa," while those cool, gray, inquiring eyes said all the rest.

"Sairy," said Skeevens, forgetting everything else, "where's that letter I got from the general manager when we moved up here, saying I could have my engine and run back whenever I wanted it?"

"Sit down, sit down, crazy man; I'll get you the precious letter after supper—tell me what the matter is. Has John Massey been up to some of his sneaking tricks?"

"John Massey's all right; it's the darned swine that I got the washroom for, whose pay I got raised, whose shop I made comfortable, whose interests I looked after without a word from them or to them—they are the ones who do the 'sneaking' trick, not John Massey!"

"Tut, tut, papa, don't have another fit like that till you tell me what's wrong."

"Wrong! Why, Sairy, you couldn't guess in ten years—they've got a petition signed asking for my removal."

"What for?"

"That's what got me—what for?"

"When did you first hear of it?"

"An hour ago."

"Well, it hasn't gone far, then."

"There's the hell of it, Sairy; that's what hurts worst; all but eight men signed it and took it to the Old Man before I heard of it."

"And he surprised you for once, did he?"

"No, he hasn't said a word; I got on to it outside."

"When did you see him?"

"Two o'clock."

"And he had the paper then?"

"He must have."

"Well, James, then you bet that John Massey is up to something—he was going to spring it on you."

"I'll fool him, Sairy; I'll go down in the morning and throw up the job and demand my run."

"No, you won't; you'll just wait. Always play your hand out. He can't surprise you, and you always have a higher court—the one that appointed you receiver of the back shop. If it comes to that, go to the general manager."

"Not I. The general manager has always come to me. I'll—Say, but wa'n't it devilish mean of them cattle, them swine, the doggoned, low-down!"

"Tut, tut. Sheep, papa, sheep—don't blame them all; they are sheep; they followed the bell-wethers. Just drive them

into the pen again, salt 'em, sell the bell-wethers for mutton, and they will all be lambs again."

"Damn a sheep ranch, anyway; I'd rather have the '318' on 'one' and 'seven' than all the darned shops between here and Tophet, anyway."

"James Skeevers, you know I'm not one of those 'I-told-you-so' women, but you may recall that I warned you that something would drop. John Massey is insanely jealous of any man that knows as much as he does, *and shows it*—I'm afraid you've showed something. But you take my advice, go back to the shop in the morning and see what happens."

"I'll take that letter, don't you forget it. I'm not going to fry and sizzle on the gridiron for days. Bet you a red apple I'll take 'one' out day after to-morrow!"

"Not till you see the Grand Mogul."

"He's going East to-morrow night for a month—we fixed his car up to-day."

"Don't he always come to the shops before he goes off on one of his trips?"

"Yes, always."

"All right, pa, something will happen to-morrow."

The next morning Skeevers went to work as usual; his fit of disgust was over; he was the same shrewd, cool, keen Skeevers. He had had an object lesson and learned something, as he told Sarah the last thing before he went to sleep, and that was that a man in his position must not pay too much attention to mere mechanical operations, but must look after his men, keep in touch with them—in fact, improve the human machines as he improved the iron ones. A successful manager of a shop knows more about handling men than about handling machines.

Skeevers made his usual round, looked over his shop orders and placed them, checked up his time card of work, took an extra run through the boiler shop, and then went into the Old Man's office.

The three scratchy pens of the three clerks stopped scratching all at once—they expected something.

The G. M. M. was polite, but as cold as the soul of a money-lender; but he said "Good morning" civilly enough.

After answering a half-dozen questions, the Old Man asked:

"What did you send Martin Tobin in here for?"

"His time."

"What for?"

"Wouldn't obey orders."

"What did he do? What orders did he disobey?"

"The order not to take tools to the blacksmith shop to be dressed, nor to grind tools himself."

"He says he was doing a special job that required a special tool."

"Johnson did it easily with the standard shape."

"The men seem to be quite dissatisfied. I don't like it a bit."

"What are they dissatisfied about? Their pay has been raised, the shop improved, and"—

"Well, they are dissatisfied with the boss. Mr. Skeevers, I could surprise you with the extent of their feeling. How many friends do you suppose you have in the machine shop?"

"Mr. Massey, you can't surprise me for a single second. You are referring to that petition you winked at, which was given you day before yesterday. It was signed by all but eight men in the machine shop. I don't care a damn for it. I could get a bigger one to *have you hung*, if Martin Tobin, John Welsh and a few others signed it first. You could have saved yourself lots of trouble, Mr. Massey, by coming to me first. You seem to think I am in the way."

"Your resignation would not cause any tears around here, and the sooner I get it the better."

"Well, you won't get it. I've a letter here from you signed by the general manager, that I can have my engine back—and I want her. As far as the shop job is concerned, Mr. Massey, you can take it and shove"—

"Hist! Hist!" said two clerks at once; "here comes the Old Man!"

The G. M. M. melted at once as the door opened. "All right, Skeevers, come in at 3 o'clock and we'll fix things up. Good morning, Mr. Wider."

Skeevers was mad again. He laid out the foundation, in his mind, for a plain talk to John Massey, went back to his office, picked up a few things of his own, and thought he'd take a final walk through the shop before dinner—for he knew that the leaders would know of the row in the office ten minutes after the officers left it.

Some clerks love to peddle gossip of this kind.

The G. M. M. wanted to keep Skeevers and the general manager apart for that one day—he didn't intend to spring the petition until his superior was well on his way to the Far East—so he steered into the boiler shop first. In going from the boiler shop to the main shop they went through the wing used as a bolt room.

"Great guns!" said the G. M. "What are all those stacks of bolts for?"

"What bolts are them, there?" asked the Old Man of Mike Daly, the "straw-boss" who ran the first machine.

"The bridge department, sorr!"

"Why, Massey, you told me you couldn't do all your own bolt cutting, and asked for a new machine not three months ago—I sent track work out on account of it. How many bolts of your own are you cutting now?"

"I haven't the figures with me. I'll look it up."

Mike answered for him.

"The same as ivver, sorr. We used to be workin' overtoime to do it before that man Skeevers came; but he do be the roarin' devil for doin' things. First, he makes them little pumps to kape squirtin' ile all the time and does away wid the squirt can entoirely; then up he hops the speed av the cutters, an' no more do we git used to that than up he hops it again. Wan av thim machines would be oidle now but for the bridge work as he took away from Davis—and mad enough he is about it."

"Skeevers is a wheel horse, ain't he, John?" said the Old Man—but Massey was busy looking at a piece of iron.

When the general manager opened the door to the main shop, he stopped short and exclaimed:

"Holy Moses!"

Skeevers had every machine tool in the place painted white; they were clean, and the light fell in dark places heretofore unknown except to gloom.

The Old Man looked around admiringly.

"It's a parlor, John; neat as a pin; now, if you'd a' asked me if you could paint them tools white, I'd said 'No,' and thought you was crazy to boot, but when it's done a fellow sees it's just the right thing. Bet you a hat the Midland will

paint their tools white inside o' six months; everybody will. It's great."

"Here's Skeevers," he continued, as that worthy showed up at the side entrance, and stopped to speak to a man on the axle lathe. "Skeevers, this here ghost show is great—I approve of it, in red ink—but, say, what are you cutting that old axle in two for?"

"An object lesson."

"Good enough; it's like a conundrum, though. I give it up; where's the lesson?"

"It isn't ready yet, but I might say that this axle is one that broke under the 'i8's' tender last week; a clean break, you see, but looks as if the iron was crystallized. I have cut half a dozen axles and seven or eight broken pistons in two and etched the surface with acids, to see if I could find out what made them break, or rather prove what breaks them. I know already, I think."

"Well, I expect it's bad material; these damn supply houses are getting worse and worse."

"But, Mr. Wider, this and all my samples are 'our own' best selected scrap material and finished in our own forge shop."

"That's curious; nothing better than selected scrap, is there, John?"

John nodded assent.

"Of course, I know both of you won't like to hear this; but it's my opinion that all our trouble with broken axles, crank pins and pistons comes from the sole and simple reason that we make the material ourselves."

"The devil you do."

"I do, just the same. Now, you cannot, at this day, select small scrap carefully enough to prevent a little steel from getting into the material. Look at the end of this broken axle; see that bright spot there. Nothing under heaven but a piece of mild steel; it won't weld. When your fagot bar is at a welding heat, the steel (which melts at a lower temperature) has burned out—a wreck is the result."

"We count that we save money on our scrap, though."

"There's lots of difference between figures and results. Wrought scrap is worth about \$9 a ton. If I was boss I'd sell it at \$4, if I could get no more, and buy new muck iron from the pig. Any good foreman can make good axles of that."

"Yes, but we've made a feature of this,

and I've sent blueprints of our furnaces and photographs of our scrap bins to my friends, and advised them to go into it as an economy. I don't see how a piece of steel is going to get in. Don't we have a blacksmith pick it all out?"

"Yes, he is *supposed* to pick it out. But he don't, and he can't. Then you should tell your friends to count the cost of breakdowns and repairs, and charge it up to 'our own selected scrap,' it's only fair."

"Let's go look at those specimens."

They visited Skeevers' office, where the Old Man viewed the broken ends of "selected scrap" material, and nodded as Skeevers pointed out the apparently crystallized part where the fracture started.

"Then, Skeevers, you want to give up making scrap axles, do you?"

"I don't care a cent, Mr. Wider; but that would be my advice if you asked it. All I want is some new iron or steel pistons and axles in engine '318,' and I guess she's got 'em yet."

"Well, your old engine is a good one, Skeevers; but you can't take more interest in her than the rest."

"I can't run but one—unfortunately—and so I must confine myself to the '318.'"

"You've run your last engine here, my boy."

"But, sir, I've got a letter signed by you, saying I could have my engine back, if I didn't suit here, or"—

"Well, who the blankety blank says you don't suit?"

"Mr. Massey asked for my resignation this morning; he's got it, and I'm"—

"Mr. Wider," broke in Massey, "I received a petition signed by all the men under Mr. Skeevers, except eight, asking for his dismissal, and I"—

"You be damned. Go, get them other eight names; then throw the measly thing into the turntable pit. Tell 'em that the officers of this road are going to send them a *unanimous* petition that they expel their 'grand, worshipful, high-muck-a-muck,' to kick their preachers out of church; to get divorces from their wives—we'll petition *them* awhile; it's just as fair."

Skeevers picked up a piece of blue paper that had been laid on his desk in his absence, glanced at it, and said:

"Here's my time, anyway, signed by my superior officer, Mr. John Massey."

"John Massey be damned. You are going to be high-cock-a-lorum here for a month, while John goes down East to watch the new engines being built at Baldwin's. I forgot to tell ye, John; but you can go with me to-night. So skip home and get ready. Skeevers, if you want to take down those furnaces out there, and sell the scrap, do it. Do anything, buy anything—you have my authority to order anything you want—provided, Skeevers, and don't forget the *provided* part, you get it as cheap as you did the tool grinder!"

The Old Man turned round in the door, with a twinkle in his eye, and asked:

"What would you take for Massey—in a trade? Scrap hose ain't worth much," he added. "But I'll tell ye, Skeevers, if ever you take your time from John Massey without coming to me, I'll couple you onto him, and make a runnin' switch of ye both up the graveyard branch, where the weeds are so high that ye can't see the telegraph poles."



A Few Everyday Incidents of Shop Management—Skeevvers Has a Collision.

When the Old Man went East last month, he left a two-line bulletin notice that James Skeevvers would act as general master mechanic during the absence of John Massey, assigned to other duties, and be obeyed accordingly. This was very discouraging to the signers of the famous petition. Skeevvers forgot all about the petition, and was the only man about the place that did not worry about it.

Having a whole month of his own way, he looked around to see if he could improve something; but there was so much needing improvement that he hesitated where to begin. While he was thinking, one of his petition-signing machinists came in with a broken gear in his hand.

"Mr. Skeevvers, I've got that cylinder borer all set in the '119's' left cylinder; but I find this gear broken. What'll I do with it?"

"How did you break it?"

"I didn't break it."

"Who did?"

"I dunno."

"Did you use the bar last?"

"No, sir, it wa'n't my turn."

"How's that? I saw that bar under your bench."

"That's where they usually keeps it; but Johnson used it last. You know, sir, us floor men take turns here, so's to even up the work. There's nine of us, and we take our turn boring cylinders, facing valves, putting in steam pipes, and the like of that."

"Well, you leave the bar where it is; I'll telegraph Stebbins for the use of his gear while we get a new one. By the way, Oscar, who takes care of the tools and wrenches and the parts of the boring bar?"

"Nobody, sir; each of us fixes it up when we use it; and when we git done, chuck the whole business under the bench."

"Who takes care of the plugs and gauges, etc., that you use in grinding in and setting steam pipes?"

"We all has plugs, or else borrows from one another."

"All right, that will do," said Skeevens. Oscar got to the door, when Skeevens stopped him.

"By the way, Oscar, about how long does it take you to get ready and bore a cylinder?"

"Well, sir, it spoils the best part of a half day for myself and helper to set the bar, rig up the rope drive and flexible shaft, and get the tools ground and ready, and then, well, say five hours for the cut. It's a job a man can't hurry, sir."

"Yes, that's so; well, I'll send for a gear. Do something else till it comes."

Skeevens telegraphed for the gear; then he took a scratch pad and figured up Oscar's time and that of his helper for the time of boring out one cylinder.

Skeevens has a great habit when alone of making a few hasty figures on a scratch pad, then pacing up and down the room, "thinking" out loud. If one could only get a phonograph in that den of his, one might get some valuable "thinks." His timekeeper, however, overheard the following soliloquy:

"I'll put one man on that job—that's the stuff. One man can fix up his tools and will keep the bar in good order. I dunno, maybe he'd spend more time tinkering with it than in working, same as that dog-goned carpenter up at the house—files his saw twice a day, wears the darn saw out that way. Ah! I've got it. I'll put that job on piece work—that's the stuff. There's enough for one man—no, there aint! Yes there is, too, if I give him the valve facer, too. He can make better pay than day's work and save the company money besides. Le'me see, that measly tangle of rope and that stinkin' old snake-wobble of a flexible shaft takes more time than the boring bar. Flexible shaft—the very name of one is enough to make me swear—they aint no good excepting for drilling or something like that. They are behind the age; better'n nothin', better'n a ratchet drill (and not so darn much, either), but they aint in it with air—that's the stuff. If I only had air on the job I'd skin things. Got the air, but no engine, and I aint got time to make one. That wim-

wam wobbler is new, too. Jest like Massey, to go buy *that* when air is the thing. By George, I've got it!"

Skeevens jumped to the telephone, rang the bell and took down the ear-piece. Of course the telephone whispered, and the time-keeper couldn't note what it said, but this is what Skeevens said:

"Hello, hello! Say, give me 1327."

"Yes, yes; Davis' machine shop."

"Hey?"

"Never you mind, Maggie, I'll do the talking and"—

"Yes, this is the Great Air Line Shops. Is this Davis?"

"Well?"

"No, I want to talk to Mr. Davis himself."

"This you, Davis? Well, say, how's the shafting lathe?"

"Yes, good trade, eh? Well, say, how much are them little upright engines of yours worth—he'y?"

"Hundred and ten? Oh, say, Davis come off!"

"Well, well!"

"Yes, I want to make another trade with you."

"No; got use for them ourselves. Say, you wanted that sand-blast for recutting files; I'll trade it to you for three of them engines."

"Nix, nix! cost \$250 cold cash—we've got more tools now, and don't use files much; then, if we did, you could recut 'em for us, couldn't you, Davis?"

"Course."

"Well, I'll tell you what I'll do; I'll throw in an air pump."

"Well, all right; send up that one this afternoon."

"Yes, have it any time."

"Good-bye!"

Skeevens hung up the 'phone and rung off. He went to his desk and made a few figures—then commenced to walk again.

"The dog-goned sand-blast aint much good anyway, recut files aint no good—'ceptin' to give to an engineer, who allus wants a file; can't hurt nothin' with one of them—air pump aint much 'count, but it goes; if it wa'n't for getting Massey on his ear, I'd unload that flexible shaft rig on Davis for something—I will yet—see if I don't!"

Skeevens sat at his desk for ten minutes

and made a sketch; then he walked through the shop leisurely and stopped, at last, beside Enoch Bridges' bench. Enoch is a young mechanic just out of his time, who seemed to Skeevers to be a man interested in his work. Enoch didn't sign the petition, because he was off when it was passed around, and he don't know just where he is yet; he likes Skeevers, but is afraid Skeevers counts him a kicker. Enoch is under suspicion by the old-timers, who stir the local pot; but he is trying to do the fair thing all around, and be decent—no easy job. He is repairing an asthmatic air pump, merely nods to Skeevers and goes on with his work.

"Bridges," said Skeevers, "will you come to my office in half an hour from now? I want to talk with you."

"Yes, sir."

Skeevers wandered around for a while, and when he got back to his den Bridges was trying to pump the timekeeper as to what in Sam Hill was up.

"Bridges," began Skeevers, "can you take that boring bar and put it in first-class shape?"

"Why, yes, sir."

"Can you keep it so?"

"Well, that's a hard question to answer; you know everybody uses it, and nobody takes care of it; but I suppose I could."

"Valve-seat planer the same?"

"Yes."

"Let's see, Bridges, you are making 27 cents an hour now, are you not?"

"Yes, sir."

"Would you object to making more—by a little extra work?"

"No, sir; I'd like it. Don't care for overtime, 'specially in summer; but I want to make more money."

"Well, I propose to take all the floor hands off and put them in pit gangs; such jobs as they do I am going to put on piece work."

"Piece work! I'm afraid of the gang, sir—they kick up a"—

"That's where the extra work will come in," said Skeevers, holding up his finger, "in keeping your mouth shut. I am going to put the jobs into separate hands anyway, piece work or no. None of them will know whether you get three dollars a day or ten, unless you are big enough fool to tell them. In a year they will all be howling for piece work. Now, I am going to

do away with that flexible shaft rig, and put in little air engines. I'll give you one to run the bar and the seat planer with. Here's a sketch of a heavy chest that I propose to have built. One end will hold the planer and the other end the bar, with a place for small tools; on the center here we will make a little pipe crane, big enough to lift the planer, a chest or a cover; the whole on wheels—you won't need a helper. You can oversee this job yourself, and get it just to suit you. You will face every valve and seat and bore every cylinder, either here or in the round-house. I'll give you so much a cylinder or seat; at first it will be just half of what it costs now, and if you don't make an average of five dollars a day the first month, I'll add enough overtime to make it five. At the end of that time you and I will settle on a price that will suit us both. You can fix up for this work and nothing else, and I promise you there will be no cut after the first settlement; all the improvement you can make is your gain. One man is going to have that steam-pipe job, and hire his own help; one man is going to have the rod work—at so much per joint—and so on to the end; no more floating floor gang for me. Each branch is going into the hands of one good man, who will be responsible for results—and I don't want any two-seventy men on these jobs—a man that can't make four dollars a day isn't the man for the work. You think this over until to-morrow, and let me know your decision. You struck me as a man likely to get out of a rut, and I'd like you to try it. Keep your own counsel, and let me know what you will do at noon to-morrow. Good-bye."

"He's half scared to death," remarked Skeevers, as Enoch shut the door. "I wonder why it is that shopmen turn pale at the mention of the words 'piece work.' Why, every engineer on the road runs by the piece, and wouldn't run any other way. I know what it is, and you can't blame them; it's the greed of the bosses, that's what it is. They pay big at first to get the men to half kill themselves to do a lot of work, then they cut them down from that basis to just a trifle over day's pay. The mechanic makes 10 per cent. on the change, the company 500—'taint honest. I'll give that boy a five-year contract if he shows a saving of 25 per cent.—and

I know he'll save 50—and it will be signed by the general manager, see if it ain't, or my name's not Skeevers. That steam-pipe job's a"—

"Misther Skaavers, sorr!" said Dennis Rafferty, foreman of the laboring gang, sticking his head into the door, "there do be a big cayrlode ave iron, pipes and biler sheets on the supply house scales. Shall Oi dump it into the house or unload it where ye's want it, as ye did the lasth jag?"

"I'll go and look at it, Dennis."

"If ye's plaze, sorr."

Skeevers got up into the car and looked at its lading, and the longer he looked the hotter he got under the collar.

"Leave her where she is, Dennis, for to-day, and do something else. I'll see about it."

Then he went into his office and wrote the following letter to the purchasing agent.

"Wm. Shaver, Pur. Agt. G. A. L. R. R.:

"Dear Sir—We have in our yard a car-load of material (car 1346) evidently not intended for us. If you will look over our requisition for the month you will not find an order for a single thing contained in this car. Please order it away, and notify us when we may expect the material ordered. Yours very truly,

"JAS SKEEVERS,

"Acting G. M. M."

"You will get a red-hot one on that," said the timekeeper, as he pounded it out on the typewriter. "Shaver is a nephew of the Old Man!"

"I don't care if he's his mother."

Shaver didn't wait to write. The very next morning he jumped on the telephone (speaking in office parlance), and ripped Skeevers up the back. Skeevers kept cool, and let Shaver do most of the talking. Among other things, he announced that the Old Man would be home that night, and that he proposed to lay the matter before him. This just suited Skeevers, and he bid Shaver good-bye sweetly and hung up the 'phone.

To make a long story short, the Old Man did come home—leaving John Massey in the East. The purchasing agent told his story with indignation, a little of which the Old Man absorbed, and the Old Man 'phoned for Skeevers to come down in the afternoon. Skeevers went, loaded. The Old Man greeted him civilly

enough, and sent for the purchasing agent.

"Skeevers," said he, "I'm sorry to see you commence quarreling with the other departments so soon; that's a thing that prevents many otherwise good men from going to the front. You run your own department, and let the other men run theirs—if there's anything that gets me wild it's quarreling between two departments, say the transportation and the motive power. Now, what's the matter between you and Shaver?"

The purchasing agent had come in and taken a seat.

"Mr. Wider, I have no desire to quarrel with anyone. I believe that all hands should work to one end. Now, you wrote me from New York that you would hold me responsible for results in my department. Can you do that if I have no authority?"

"But you have authority, sir."

"How much authority has an officer who orders a pail when another officer can, unknown to him, change the order to a quart measure?"

"Has that been done?"

"Worse than that. Mr. Massey says nothing; if you told him to make a boiler out of bass-wood, and carry 300 pounds pressure on it, he'd do it, excusing himself by saying it was orders. I feel responsible for the boilers I work on—and if one of 'em blows up, you will hold me responsible, and I'll hold myself responsible."

"I am building a new boiler for our night express engine, and I ordered certain materials that I considered necessary. Mr. Shaver, here, saw fit to change that order to the materials *he* thought necessary. The only question now is, who you will put in charge of the work, who you think the best judge? If I do it, I will be responsible, and not you. I shall decline to build a boiler of a design I am afraid of, or to use materials I think unfit."

"Pretty strong language, young man."

"I know it, sir, but it's necessary; there's scarcely an order from our shops that is filled with good material. Mr. Shaver's duties are to buy cheap, and he can't see a thing on earth but price. We have had worlds of troubles with flues. We have a Midland engine rented here, and she has less than half the trouble; she is chain-

ganged with the rest, so it's not our peculiar service. She has charcoal iron tubes that cost twenty-odd cents a foot. We use a cheap steel tube that costs 13 cents. This night express is our most important train; you know the importance of its connections. I want a boiler that will give the least trouble in service. Iron is better than"——

"Now, Mr. Skeevens, that's all agents' talk; we've seen chemical tests that show steel tubes are far better than iron," broke in Shaver.

"Agents' tests?" asked Skeevens. "I don't care a cent for such proofs; we have the proof right on the road. We have more delays to trains than any neighboring road—why? Because we buy the cheapest brasses, the cheapest flues, the poorest babbitt and the cheapest coal."

"Mr. Skeevens," asked the Old Man, severely, "are you not a little out of your line? I'm not asking you for advice about purchasing everything in general. What is it you don't like in this car of material?"

"I don't want those cheap tubes. I ordered best flange plate for that boiler, and got the poorest quality of steel rolled, not fit for tanks. I ordered Mushet steel for tools, and got some two-cent stuff that it's a waste of time to work up. I ordered a 9½-inch air pump, and got a double-barreled thing of a bastard make.

"Mr. Wider, it's like this: either I know what's best or not; Mr. Shaver knows or not. I think my training has taught me what is needed; his has taught him to buy the closest. I am just as interested in doing things cheap as he is. But if he cuts the price in first cost he shows it to you, and gets congratulated right there and then. I have to *live* with his cheap material, and keep it in running order; if it's poor the running repairs are high. Do you 'go for' Mr. Shaver? I guess not; you come to the shop and want to know why our running repairs are higher than they were. Mr. Wider, I'll illustrate it to you"——

"That's it—give us one of them object lessons, Skeevens."

"You are a civil engineer; you built this road, and you don't ask Mr. Shaver's advice about track or bridge' material. Suppose, when you ordered that seventy-five pound steel, Mr. Shaver, and an agent or

two, had come in here and tried to convince you that sixty-pound iron was the proper thing; because you had it before and it was cheaper wouldn't convince—would it? Well, suppose Mr. Shaver didn't come in at all, but just ordered the sixty-pound iron and cancelled your order —what would you say when you saw the yard full of it?"

"I think likely I'd swear, Mr. Skeevens —yes, in fact I know I would."

"Would you keep the iron and use it?"

"No! and you needn't use that stuff. You're right about this."

"I can use the material for repairs; it's no worse than the stuff we have used; but I think the master mechanic should be allowed some discretion about the quality of material he uses."

"So he had, so he had; I'll fix this up with Mr. Shaver. I'm coming up in the morning, Skeevens, to see what you've been up to while I was East. I hear you've raised the devil again." The Old Man pulled a drawer out of his desk and held out a box of cigars toward Skeevens. "Shaver," said he, "come and take one, and smoke the pipe of peace; and Skeevens, let this be an object lesson to you—you do keep infernally bad cigars in your den up there; taste like they had oil on 'em."



How to Scarf Flues—Great Inventions That Can't be Patented.

John Massey is home again, and Jim Skeevens is only foreman of the shop to shop men, and plain "Skinny" Skeevens to the engineers.

Massey and the Old Man took a walk through the shop the other day, and were clear out in the boiler shop before they ran onto Skeevens; that hearty was testing some flues that had just been safened by pounding the welded end on the floor.

"Skeevens," said the Old Man, as he cut off a mouthful of plug, "are you working up one of your object lessons?"

"Well, yes, sir; sort of a limited one."

"Where have you put that scarfing machine, Mr. Skeevens?" asked Massey, looking up at the holes in a girder and the dirt where a countershaft used to be.

"Outside there by the scrap bin."

"Outside! Why, man, I only got that running a few days before you took hold here—you ain't stopped usin' of it?"

"Yes; I think I have found a better scheme—I'll show you how it works."

As Skeevens moved away toward the flue welder, the general master mechanic dropped back with the general manager and remarked:

"That's a shame. You remember how I showed you the way the scale prevented a good weld when the scarfing was done hot, and that you aproved my home-made tool to *cut* the scarf—'cause we always have clean metal to weld. Don't you remember?"

"Yes; 'pears to me I do."

"And now this loonytic has throwed the scarfer away—and it cost three hundred dollars."

"Say, Mr. Skeevens," said the Old Man, "did I understand you to say you had thrown the scarfing machine away?"

"Yes, sir."

"What for?"

"Let me explain after you see the way we weld the tubes now—think I could make it plainer then."

"All right, sir."

Skeevens stopped before several sets of flues standing on end against the wall, and, selecting one, gave the stone floor a smart rap or two with the safe end, breaking it off through the weld.

"That," said Skeevens, picking up the piece, "is one of a set of flues welded before the scarfing machine was made—a set too short, been up at Granger for a year. You see that the welded joint is very thin; half the metal did not join, and looks black. Now, some of these do pretty well, but in time give out, causing trouble. Mr. Massey looked at some of the broken welds, and came to the conclusion that it was scale—it certainly looks like it. Now, he sought to cure the trouble by furnishing clean metal at the welding point, and he got it with the machine toggled up out of an old bolt cutter. Now, this next set was welded up last month, using the cut-scarf ends."

Skeevens broke one as before.

"Pretty fair job, but you see that the weld looks just the same as the old one. The welded joint is not more than half as thick as the tube. Looks as if there was scale in there yet, don't it?"

Massey looked at the safe end; the Old Man put on his specs, and gave it a careful inspection.

"Break another one," ordered Massey.

Skeevens took down one, and it required several blows to break it, but it finally broke in the weld.

"Pretty good job that, as welds go, but it broke in the weld, and it looks the same, Mr. Wider."

"So it does, so it does."

Skeevens looked at Massey, but that worthy had fished up a pocket magnifying glass and was looking very wisely at the break.

"Now," said Skeevens, modestly, "I got to thinking about the trouble we have had with safe ends, and the result is that I defy you to break this tube—selecting one from another set—in the weld."

Skeevens slammed the welded end on the floor time and time again without other effect than to batter the end, then he put it in a vise and, with help, bent the tube—but not in the weld.

"Beats the devil, don't it, John?" piously remarked the general manager. "How do you scarf 'em, Skeevens?"

"Don't scarf 'em at all."

"Thunder and —!"

"Watch that weld being made there," said Skeevens.

The workman took a flue out of the furnace, knocked the hot end on the anvil to clear it of the scale, slipped it on to the mandrel under the little trip hammer and the other end in a V-notch, made to receive it, the end itself resting against a post. His helper brought a safe end from the same furnace at the same time, knocked the scale off, slipped the hot end over the mandrel and gave it a smart rap or two with a heavy mallet. The workman put his foot on the belt-tightener, and the little hammer played a tattoo on the flue as the smith turned it over once or twice with his hand.

"That's jumping of 'em on," observed Massey, "and any mechanic knows that a 'jumped' weld ain't no good."

"That all depends on what you've got to 'jump' and the conditions of the heated parts. Now, if you take a 1-inch rod and a 1½-inch rod and put 'em in the fire until one of 'em is at welding heat, which one will get ready first, Mr. Massey?"

"The smallest will."

"Just so. Now, nine chances to one if you leave 'em both in till the big one is ready to weld, the little one will be burned. If they are both the same heat—dripping hot—a 'jumped' weld, as you call it, is just as strong as any that can be made—stronger, in fact.

"Now, your scarfed tube and safe end has a sharp edge, and that edge gets hot first, and is burned when the body of the tube is hot enough to weld. What's the result?—a bad weld; looks like scale, but it's burned material.

"With a butt weld, the material of the tube and the end are of the same size; we heat them in the same furnace, to the same heat, and make a perfect weld. Cut one of these tubes in two, and you will find the metal clean and solid clear through, and a little thicker than the tube—that is on account of the mandrel, and explains why you can't break the tube in the weld. I'll give a dollar for any tube there that you can break in the weld."

"Then the scarfer is no good?" asked

the Old Man, passing a sly wink to Skeev-
ers.

"Just the same as winter before last's
overcoat—you don't need it now."

"Well, that's an object lesson, John,"
said the Old Man; "kinder of a litter of
'em. Firstly—Old prejudice against hop-
pin' welds is dead wrong on flues. Sec-
ondly—Scarfin' machine no earthly ac-
count where you don't want to do any
scarfin'. Thirdly—Thinkin' about a thing
is important. Fourthly—Thinkin' in the
right direction is more important. What's
the use of thinkin' up a scarfer, when you
can just as well think up a plan to stop
scarfin' altogether—say?"

Massey wandered on to a fire where
they were making grab irons by the cord.

"Say, Skeevers, darned if that wouldn't
be worth a patent; I'll go halves with ye.
Lemme see; what do you do? *Don't scarf flues for weldin'.* Hum!—why say, Skeev-
ers, you can't get a patent for *not* doing
something, not if it saved a thousand dol-
lars a minute, could you now?"

"Well, hardly; I did think I was orig-
inal in that till day before yesterday, when
a drummer for a boiler plate company
came along and I showed it to him.

"'Why,' said he, 'Skeevers, old boy,
that's old—way back yonder. Why, man,
you couldn't get Bill Tyler to weld a flue
any other way, and he's been in the busi-
ness so long that he's some relation to
half the flues you see around the country.
The government specifications call for
butt welds—where have you been for the
last ten years, anyway?'

"Give me a lot of chaff like that, but he
owned up that he never heard of a rail-
road welding tubes that way, but he said,
'What's the use of telling these ducks any-
thing, anyway? They never go around to
see other things, and they feel sorry for
everybody in the world 'cause they don't
do work as they do.'"

"John," said the Old Man, as they
caught up to Massey, "if you've got such
a thing as a note-book with ye, just put
down in large red letters, '*Jumpin' welds
is the stuff!*'"

"Say, Skeevers," he added, "couldn't ye
work that scarfer off on Davis for a lathe
or a lean-to, or a chimley, or something?"

**Sixty-nine Years of Useless Work
on a Clinker Pit—Automatic
Coal and Sand Shovelers—
The Laborer Worthy of
His Hire—The Lady
or The Tiger?**

Did you ever notice how things go by
threes? Jim Skeevers went down to the
roundhouse one night last summer, fell in
a pit, and was carried home—that was
three on Skeevers.

While Jim was laid up the general of-
ficers of the Midland visited the shops.
When the general manager is absent, Mas-
sey, the general master mechanic, always
speaks in the first person—"I" did so-and-
so, "I" made this change and "I" saved
so much. It was an "I" day, and Massey
showed up all the kinks devised by Skeev-
ers and said "I" every time. The Mid-
land people were impressed with the re-
sults, and, being progressive and not
averse to "taking men away" if they
could better their own service, the man-
ager wrote Massey an offer of the position
of superintendent of motive power of
the Midland at better pay than he was get-
ting where he was.

Massey had no idea of going, but
thought—short-sighted man—that the G.
M. would "see" the pay offered to keep
him. But Mr. Wider congratulated him
so hard and advised him so strongly to
take it, saying that he and Skeevers would
worry along somehow, that really Massey
had no choice but to accept—that was
three on Massey.

It was also three on the Midland.

When Massey's resignation was safe in
his desk, the general manager smiled a
satisfied smile, shook hands with him-
self and took up his pen.

He wrote a notice that the position of
M. C. B. was abolished. Then he wrote
another that James Skeevers was ap-
pointed superintendent of M. P. and R. S.,

vice John Massey, resigned, and took them in to the first vice-president for approval, got them signed and had one hundred copies of each printed.

Two days afterward they were posted in all shops and offices on the road—then he hopped into his buggy and drove up to Skeevers' house.

Skinny was sitting in one chair on the porch, nursing his leg in another, reading.

After the usual courtesies, the old man pulled out a copy of the notice and handed it to Skeevers, with much the same feeling that a man has when presenting a child with a new toy. Skeevers knew what the notice said well enough, but he read it through gravely, and, turning to the general manager, said:

"Mr. Wider, I thank you for the compliment paid me in this appointment, but before accepting it I want to talk with you about it a little; I have never said anything about wages before, but may I ask what your intentions are as to pay?"

"Oh, it pays better than usual. Massey got \$3,000 a year."

"And Mr. Green, the M. C. B.; what did he get?"

"Eighteen hundred."

"And you are proposing to pay me —?"

"Three thousand."

"To do Mr. Massey's work, as well as Mr. Green's?"

"Well, you'll oversee everything on wheels, of course, and"—

"Well, Mr. Wider, as I said before, I am obliged for the compliment, but I don't want the job at that figure."

"Don't want the job?"

"No, sir."

"Good Lord, man, what do you want? Ain't the earth good enough for ye, or shall I telegraf for a couple of planets of something? Why, there ain't a man in the department but what would jump at the chance."

"I know it, sir; and that's just what's the matter; they are so eager for position that they have disgraced the job of master mechanic to the lowest round of the railroad ladder. The heads of this department do more work, take more responsibility, have to have a longer training and more experience than for any other job on the railroad, and—get less pay for it. Now, I can't reform the whole system of disgrace, but I can keep one

sucker from getting into the hole, and his name is Skeevers."

The general manager was dumbfounded. He looked at Skeevers for ten seconds, and then said: "Well, I'll be —; say, what do you want, anyway?"

"Mr. Wider" continued Skeevers, "you don't think anything at all of paying your general superintendent \$6,000; your division superintendents get \$250 a month, but your master mechanics get \$150. Our general superintendent was an operator, then a dispatcher—he's a good man, but he has had less than ten years' experience as a railroad man, and all that in an office—your division men all came from conductors. Two master mechanics were engineers here of many years' experience, good men, both of 'em; one was a machinist, and he's a daisy. These officials have a larger force of men under them than all other officers combined. They can save or waste more money than any other officers, and every one of them has introduced reforms within a year that save more than their wages, yet you think that they are well paid. Why, sir, not one of 'em but what has engineers under him that get more money. You won't pay them more because it's the custom to pay the best men the worst. As for me, I have made up my mind to go braking—I'd rather get into the transportation department, where the hours are shorter, private cars possible and pay higher—to say nothing of the work being lighter."

"Well, Mr. Morality—not that it'll make much difference—I'd like to inquire for what consideration you would condescend to take charge of our motive power and rolling stock departments for—say—a year?" asked the general manager, with half-mock formality.

"Well," said Skeevers, musingly, "I don't just like this cold-salary figuring, but since you've asked me I'll make you two offers: First—I'll take the job for one-quarter of the saving I make over the past year's management; that, I figure, will not be less than \$10,000 for me. But, if you like the straight salary scheme, here's a second offer—I'll take the job for \$5,000 per year, if you will pay my division men the same as you do division superintendents. I want 'em to hold up their heads and 'feel their oats,' as horse-men say."

"Why, Mr. Skeevvers, our president wouldn't listen to it for a moment; he'd hold up his hands in holy horror and tell me what the other roads were doing, and he'd"—

"Oh, no, he wouldn't, Mr. Wider. Do you remember when we took him over the road and you tried to tell him how much we saved by some shop changes, and how he stopped you and what he said?"

"Well, what did he say?"

"He said, 'Mr. Wider, that's what we've got *you* for. Don't, please, bother me with details; *what I want is net results*. Come to me with them.' That's what he said. You just ignore precedent once; pay this department what it deserves, and I will give you some net results to take to the 'Sphinx,' as you call him—he won't ask what you pay your superintendent of motive power or your master mechanics—it's *net results* he wants."

The Old Man poked a morning-glory blossom with his cane for ten minutes before he thawed out; then he said:

"Well, Skeevvers, this is a clean case of highway robbery, but you are the doggondest man for having your way I ever run up against. Your object lesson on pay is good enough, but I tell ye there must be some *net* to show for this—some object lessons."

"Thank you, Mr. Wider; you come up to the shops next Saturday week, and I will show you one object lesson, if not two, that will help pay this extra; and, by the way, I should like very much to notify my master mechanics of their raise in pay—you to approve letter."

"All right, Skeevvers—er, by the way, did I hear you say that you had a small, brown box that you wanted me to examine—a paper-trimmed box, with a tack for catch, paper hinges and a—ah! thank you, Mrs. Skeevvers, you are a thoughtful woman; anyone would think these were dollars instead of cigars, the way your husband keeps 'em hid."

That was three on the old man; so you see the whole thing went by threes.

In due course Skeevvers notified his three master mechanics that "on account of faithful services and the intelligent use of their brains, they had shown themselves worth more to the company, and the company was pleased to notify them that hereafter their pay would be increased," etc.

Of course, that discouraged 'em wonderfully.

A week from the following Saturday the Old Man showed up at the shops and entered Massey's old office—things were changed.

The old M. C. B.'s office at the car shop had been shut up and the two best clerks brought to Skeevvers' office; the three others were relations of Green's, and Green was a brother-in-law of Massey's, and Massey had made place for 'em all on the Midland. Skeevvers had saved four men, counting Green, by the deal. That pleased the old man, for the pay-roll was the bane of his life, and the one thing that the "Sphinx" looked into and commented on—wanted to know where the *net* was.

As Skeevvers steered him toward the roundhouse they went through the boiler room.

"Saved two coal-handlers here," said he; "we used to dump coal into these big bins on the side of the house; it was 30 feet from rear wall to boiler fronts; had to keep two men wheeling coal ahead. We built a framework in there of old bridge timbers and planked it over on an incline, and now all the coal dumped slides ahead to shoveling distance. Bins only hold half the coal, but that don't count; we have lots of it in the yard all the time."

"Good idea, good idea," said the Old Man.

At the sandhouse Skeevvers pushed the door open and disclosed an old, crippled pensioner sitting before the drier.

"We piped this place for air," said Skeevvers, "and put false bottoms in our bins, so that the sand, as unloaded from the cars, will slide toward the drier. We elevate it by air and draw it into sand-boxes instead of putting it in by hand with buckets. All this man does is to keep up the fire and move a lever now and then. This belt of buckets fills the drier, and the dry sand runs to the pressure tank, from which it is elevated—saved the work of three men."

"Object lesson No. 2," said the general manager. "Very good; why don't you duplicate this plant at Granger and the other engine terminals?"

"I can beat that by putting in another drier here and drying all the sand for the system; or, if you will buy air-jet sanders

for the engines, this drier will take care of the whole system, save buying half the sand and hauling and handling it, besides wiping out five sandhouse gangs."

"Yes, but we've got the driers."

"Certainly, but labor and the cost of extra sand goes on forever. I meant to get those sanders before you knew it from the saving here; but here we are; this is what I wanted to show you."

"Now," said Skeevvers, "this roundhouse has been in use for twenty-odd years. For all that time, night and day, two men, and sometimes three, have been working at this cinder pit."

"Look at it; 40 feet long and 4 feet deep, and for twenty-odd years every engine that went into that house has dumped her ashpan and cinder hopper here; the men have put a barrel or two of water on to the cinders, and then got into the pit and shoveled them out on to the ground. When the pile got so big it was in the way, some cars were pushed into this side track over here, 20 feet away, then the cinders were shoveled up into them and hauled out into a siding. When there were ten loads the road department, after much telephoning, would consent to take them out where they wanted them and unload the cars. Five to seven handlings, depending on the weather; for in winter the wet cinders froze in the pit, the pile and the cars.

"Long ago I determined to do something with this place, and it's the first thing I tackled when I got back to work. After I was half done I found in the pigeon-holes of my desk no less than five letters from yourself, the general superintendent, the roadmaster and the chief engineer, telling why this very change could not be made; but it's made, and it has cost none of the departments a cent. I dug this pit with the cinder-pit men and the laborers I saved in the sandhouse and boiler room. Those cast-iron posts on one side Massey had made for the purpose more than a year ago, feeling you would let him put in the pit. You refused, and he hid the castings.

"Now, you see we have dug a pit this side of the cinder pit, deep enough to drop the top of a gondola below the bottom of the cinder pit, which has been half filled up. One man cleans the fires and hoes all the cinders into the cars as fast as

taken out—no frozen cinder pit, no shoveling or piling up of ashes. When these two cars are filled, and we find they are filled in about three days—we take an engine and throw them out into that spur. As long as we have cars I don't care when the road department gets rid of them.

"That wall we made of old material, with the exception of the cement; we have saved three men's work and no end of trouble—what do you think of it?"

The general manager looked, but Skeevvers couldn't tell from his face whether he was pleased or displeased—he had become a Sphinx himself.

Skeevvers continued: "The engineer said we couldn't get the track in on this curve, the foundation wouldn't stand, and that the car pit would freeze up. The roadmaster said it would cost his department \$150 to dig the pit and lay the track. The superintendent said it had done well enough for twenty-three years, and he couldn't see the use of investing four hundred dollars in an 'innovation,' and you said we couldn't afford it; and all the while the machinery department was hampered by it, and went on paying three laborers for twenty-three years because we couldn't spend, say, \$200. Just think of it; we have paid a man's wages for *sixty-nine years* for want of that pit improvement."

Then the Sphinx thawed out: "And this is official object lesson number three, hey? Well, Skeevvers, it's a good one—a devilish good one!"

"I don't call this an object lesson at all; it's an incident of shop management. The real object lesson I hoped you'd see does not seem to have struck you at all."

"Ho, ho!" said the Old Man, "gettin' thick-headed, am I? Well, damme if you don't take the cake—but maybe you ain't so far wrong—the pit's a good thing; what else have ye got hid? Where's the lesson?"

"You think the pit a good thing; do you approve of my building it?"

"Yes; why, certainly. I can see on its face that it'll save money."

"Well, then, Mr. Wider, it seems to me the object lesson lies in that fact. I would call your attention to your letters, showing that at five different times you have refused to fix this pit. Mr. Massey asked

your approval of or your permission to do everything. His only idea of getting the pit fixed was to have trackmen dig the pit and lay the track, masons to build the wall and engineers to plan—I did the whole job with my own laborers. You have refused to build the pit, but never refused to let us do it ourselves.

"My old father used to quote a maxim something like this: 'Never tell what you are going to do—do it.'

"To call a manager's attention to every detail and change one anticipates calls for action on his part, and in times like these, action means to turn down anything that costs fifty cents. To ask advice calls for criticism, discussion, argument and delay. I am best fitted of your officials to say what we need in the way of a cedar pit; I knew you would refuse to spend money on it, and I have built it out of savings elsewhere; it has cost the company practically nothing.

"I know what our expenses for last year were. I propose to keep below that expense month by month, and make some needed changes without money outlay before winter sets in. I feel sure the best way is for me to go ahead on that line and not bother you with details. Before the next annual meeting I will show you some *net* savings, but now is the time for you to say whether it shall be my way of working or Massey's. Of course, any change that costs extra money should go to you first; but about things like this, what do you say—the Lady or the Tiger?"

"Gimme a cigar," said the Old Man, and Skeevens fished one out of his vest pocket.

"Skeevens, it seems to me that the difference between you and Massey is that he talked about things and you do 'em."

"I hardly think you are fair to Massey; he was held down, never allowed to do things, good or bad; but it was because of his everlasting asking *if* this and *if* that. The only *if* you ought to care about is if the head of this department is capable of taking care of it. It's *results* you want, not the way I think the results might be had if you would take the responsibility."

"Yes, you bet; *net*, that's what I want; some *net* results to show up when our president comes out. The Tiger is my choice, Skeever; but, mind ye, a regular tame tiger, that a feller can lead round if

he wants to; none of ye'r wild, yowling man-eaters that keep a feller up a tree half the time. And, Skeevens, you'll consult me before you incur any extra expense?"

"Certainly, and you'll be satisfied if my total expenses are less for each month of this year than they were for last?"

"Yes."

"And suppose I can show a saving over the previous month as well, for, say, a year, you won't interfere with the *how*?"

"No, nor the why eyether; get me some *net*. The 'Sphinx' will be asking for *nets* before he gets off his car; when do ye expect any in, Skeevens?"

"Got the books full of 'em now; there will be more *nets* than usual in the next month's report," said Skeevens.

And that night, as the Old Man finished telling the general superintendent about the interview, his highness asked if that was what he called one of Jim's object lessons.

"Object lessons?" said the Old Man; "why, sir, it's a whole liberal education. Sullivan, me boy, cultivate that man Skeevens; he'll be president yet—he *does* things."



Train Delays—Sullivan's Lesson—
How to Cure the Trouble on
Freight and Passenger
Trains—The Grief
Committee.

Sullivan, the general superintendent, always delighted in rawhiding Massey, and he commenced on Skeevens before that worthy had gotten his seat warm.

The Air Line has been notorious for train delays—freight and varnished cars alike—and Sullivan seemed to take a savage delight in writing and telegraphing the mechanical department, asking what was the matter with this engine or that, and carrying his complaint to the Old Man.

Skeevens made up his mind to give Sullivan an object lesson.

Sullivan told the general manager that he (Sullivan) would spring an object lesson on Skeevens at the first "council of war."

This "council of war," as he was pleased to call it, was a new idea of the general manager's. He had noticed the custom of having all the master mechanics meet, that Skeevens introduced, and proposed that all heads of departments should meet monthly in his office. The first meeting was set for a certain Saturday three weeks away.

Now, the old time-keeper in Skeevens' office owned a pretty daughter, and a clerk in Sullivan's office was young.

He also knew the girl.

Visiting with his prospective "poppa" one evening, he remarked that "His Highness" was working up some new scheme, and proceeded to explain that Sullivan was having a tabulated report gotten up of the passenger-train delays for six months and the cause. As the cause was taken only from the conductors' reports, there was a woeful lot of "low steam," "hot box on engine," "lost time, account of wind," and "bad coal." Both men wondered what he was going to do with it.

The elder man told Skeevens in the morning—and Skeevens knew.

The general manager's car was in for repairs, and Skeevens took the Boyer speed recorder off it, and had it put on Dick Murray's engine, boxed over, and put the key in his pocket. Murray was sent for and told to keep still and saw wood. He was not supposed to know what was in the box; if asked, to say that Mr. Skeevens told him that he was getting ready to indicate the engine—which was true.

Dick Murray's engine is double-crewed, on a local passenger train, over two divisions.

Then Skeevens had some slips printed, with a list of the stations on the road, with room enough between the names to write a line, and sent for every passenger engineer on the division. He also sent a supply of the slips to each division master mechanic, with instructions.

The result was that the evening before the date of the "council of war," Skeevens had a complete record of every delay to a passenger train on the whole road. He knew between what stations time was lost, at what stations, and just how many minutes and seconds could be properly charged up. This information was in the shape of many thumb-marked slips; but Skeevens got his best clerk up to the house that evening, and they tabulated the whole thing, and he had it in his breast pocket when he shook hands all around in the Old Man's office.

"Gentlemen," said the Old Man, opening a box of domestic cigars and placing them on the table, "this is an informal meeting. I desire that each and all of you will talk freely here on everything that has any bearing on the operating of the road. Suggestions are in order. Complaints can be made and remedies will be discussed. If there is any friction between department heads, here is the place to apply the grease. I shall refrain from saying much—suppose I act as judge. If there is any man present who thinks he has a plan for saving a dollar, or improving the service, we will discuss it. Sullivan, here, always has a suggestion; Doris is a kicker; O'Hara's pet grievance is over-worn tires on frogs, and Skeevens' hobby is object lessons. Gentlemen, I'm listening to you."

For about two minutes after the Old Man sat down there was a very embarrassing silence, and then General Superintendent Sullivan arose and pulled out a formidable-looking table, full of figures, red and blue lines and an array of totals.

"Your Honor and Gentlemen of the Jury," began Sullivan, who is a taking kind of fellow, "I hardly expected to assume the rôle of attorney for the prosecution, but it seems as though that honor should be mine.

"Gentlemen, I ask you what is the one bad thing our road is noted for above another? If we were asked to name it, is there one of you who would venture to dispute me if I declared it was delays to passenger trains? We seem to be more unfortunate in this matter than neighboring roads; the newspapers are pounding us, the general manager making personal inquiries, and delays are getting no better.

"Going into details proves something, and I propose putting before you a mass of statistics, compiled from the official reports in my office, that shows the number, extent and cause of all delays to passenger trains for every day of the past year.

"Before going into details I will simply quote you the totals, to show to what extent the delayed-train business has reached and the percentage of each known cause of delay.

"I find that of 9,388 passenger-train trips made during the year, 4,931 trains arrived at destination or connecting train points late. If an outsider should declare to any of us that more than half our trains were late we should resent it, but it's a fact, nevertheless.

"Investigating further, I find that there are five legitimate causes of delay, namely:

- "Defects of equipment;
- "Motive-power failures;
- "Hot boxes on trains;
- "Operating faults;
- "The elements.

"The total delays for the first only amount to the small sum of 3 per cent., which, I think you will all agree with me in saying, reflects great credit on our general manager"—and the taffyer bowed low to the judge.

"Operating failures—delays in dispatching, etc.—5 per cent. The elements—wind, snows, wash-outs, etc.—9 per cent.

Hot boxes on trains, 14 per cent. Motive-power failures, 69 per cent.

"Gentlemen of the Jury: I leave the case in your hands; each of you can now see the amount of total delay and what part of it comes under your jurisdiction. I think, if it were not for stealing the thunder of my friend Skeevers, I should be strongly tempted to call this an object lesson." And with a smile of triumph, "Himself" sat down, while the train-master and the purchasing agent clapped their hands.

Slowly the Old Man rose to his "pins," looked around the circle, took his cigar out of his mouth, and said:

"Gentlemen, this is the one sore place in my life, and Sullivan has tore the scab off. I think he has done a good thing in compiling this information. It's a basis to work on. In other days I should have abused Massey and threatened to discharge him; but now we have a new head to the offending department, and I shall certainly expect a reform in it—in fact, I believe I shall demand it. But—well, there is one thing more to be done before I get too angry, and that is to hear from Mr. Skeevers. Maybe he's got an object lesson bigger than this one up his sleeve—but, of course, a man who comes prepared for battle is twice armed. Mr. Skeevers, it looks as if the burden of proofs lay with the attorney for the defence, and you seem to be that attorney."

Skeevers stepped over to his overcoat, fished up his package of slips and his balance sheet and laid them on the table.

"If it please the court," he began, gravely: "It seems a good business policy when you bring in your bank book from balancing to produce the vouchers.

"I take exception, your honor, to your allowing the attorney for the prosecution to bring charges against an officer for the shortcomings of his predecessor in office.

"These statistics extend back a year. I claim an alibi for my client, the superintendent of motive power, and stand ready for trial on any charges that may be made against him during his term of office."

"Quite correct," said the judge, with a merry look in his eye, for he knew that Skeevers was loaded.

"Statements based on last year are too far away to be a good basis for instituting reforms, but last month would be of

use. The learned counsel for the transportation department states that he has a detailed record there of every day."

"I have," broke in Sullivan.

"Very well," said Skeevers. "Let me ask from what source this information was obtained?"

"From the conductors' reports made at the time."

"If the learned counsel for the other side had lived and worked with conductors as long as I have, he would not so freely take their simple word on so important a matter. Men whose excuse for a delay can be shifted from their own shoulders to some inanimate thing, like a hot box, or a bad coal pile, can hardly be expected to protect the coal or the hot box."

"But generalities prove nothing specific. You can't charge a man with being a thief and send him up without proving a specific case. You have got to point out at least one actual theft. Now, with the permission of the court, I will state that I have some evidence to offer—irrefutable evidence."

"For nearly a month past I have had a Boyer recorder on '7' and '8,' from this end of the road to the other; the sheets are here, and have no interest on earth but to tell the cold, naked truth. Further, I had printed and put into the hands of every passenger engineer on this road a slip like this"—holding one up—"with a list of the stations. These slips are dated, and state number of train and engine, and give the names of crew; and each engineer has marked down at the time and place—not the end of the run—just what time was lost between stations, and at stations, with the cause."

"With this data, your honor, I hope to at least explain some of these delays; and now, going into details, I should like to cross-examine a little, and would ask the last witness and lawyer combined to please state to the court how much late No. 8 arrived, say, last Saturday?"

Sullivan ran his finger along a line on his chart, and then followed down a red line. Skeevers stretched a long recorder sheet across the table and sorted out a slip.

"Twenty-one minutes," said Sullivan.

"What caused this delay, according to your information?"

Again Sullivan consulted his chart, and looked up a bundle of reports in a file.

"Lost seven minutes at Holdin, cleaning fire and taking water; twelve minutes at Carey's, hot box on train; eight minutes at Midland crossing, brakes stuck—twenty-seven in all; made up six."

"If it please the court," said Skeevers, "I should like to call attention to the fact that seven minutes' delay at Holdin is a remarkable record for celerity. No through train—no matter how light or fast—ever stopped at Holdin and got away in less than six minutes, and ten is a fair average. The cause of this is three-fold, and I will leave it to you whether or no any of them should be charged to the motive-power department. In the first place, no train can pass there without water; the tank is located in the yard, making it necessary to make a special stop for it. This takes three to five minutes. This delay to every train should be charged to bad equipment; water plugs should be placed at the station, so that trains in either direction could take water at the station stop. In the second place, it is a register station. In the third place, it is a big town, and there is lots of baggage and express to unload. In the fourth place, there is no cinder pit going west, making fire-cleaning hard. In the fifth place, the head of our operating department seems to understand nothing of the cause and necessity for all this time at Holdin, and makes out his time-card with leaving time only. Between Taylor's and Meadows, a suburb of Holdin, going west, a distance of 10 3-10 miles, the time of express trains is a little over 28 miles per hour; it's down hill on straight track—have to kill time daily—there is no dead time at Holdin, and the time from there to Parkland, west, on a grade of 64 feet per mile, is 30½ miles per hour. This delay to every train is directly chargeable to bad equipment at station and want of judgment in making time-card. Good judgment in the latter could be made to remedy the fault of the other, in a large measure.

"Now, then, to proceed. The other side report a delay of twelve minutes at Carey's—a little town of fifty inhabitants—cause, hot box on train. Gentlemen, the speed recorder says that this train stood at Carey's sixteen minutes, and the engi-

neer's slip says: 'Sixteen minutes at Carey's; conductor went over to store and bought two sacks of potatoes and a tub of butter; had them carried over to the baggage car, and asked me to make up the time, as they were for Mr. Sullivan.' Evidently, the report of 'hot box' is a plain lie. This can be charged in the liar column, or against the operating department, or the culinary department, or any place it may please the court—except against the fellow who made up some of the time."

The Old Man looked so hard at Sullivan that his cigar went out.

"'Eight minutes at Midland crossing, brakes stuck.' Your honor, the honest recorder says that the stop at Midland crossing occupied only a fraction of a minute—just a full stop and no more. I would ask the court who lies—the Boyer or the conductor?"

"The conductor!" said the Old Man.

"Yet," continued Skeevers, "here is a nine-minute stop half a mile west of the crossing. Let us see what the engineer says," and he picked up one of the thumb-marked slips:

"Conductor pulled on brake to put off tramp; didn't know enough to close closet valve (kind without spring); had to bleed off brakes."

"This should be charged to faults of operating. Probably it would be a good thing to send for the Westinghouse instruction car, or the fool-killer.

"Now," continued Skeevers, calmly, "take our Atlantic express—makes the fastest time, the most connections, and loses the most time. Will the judge please mention any date, and we will compare data?"

"Try the 13th."

"That's unlucky," said Sullivan. "But let's see; 13th. 'Arrived six minutes late; engine not steaming.'"

Skeevers hunted up his slip.

"Lost six minutes on running time. Cause—Picked up officers' car 101 at Holdin, making eleven, six sleepers; left Holdin three minutes late; lost three on hill."

"Here is another case of operating," said Skeevers. "The general superintendent stops our most important train, already too heavy, to put on his private car, to come 47 miles on the heaviest grade we have; when, by waiting sixteen min-

utes, he could have come in on the Granger local, a three-car train, arriving home only thirty minutes behind the express. Will you charge that to engine failures?"

The judge bit the end off his cigar, made a memorandum in his note-book, but didn't say anything.

"What about No. 3, yesterday?" asked Sullivan.

"What does your conductor say?"

"Eighteen minutes; engine not steaming."

Again Skeevens hunted up a slip and read: "'Arrived eighteen minutes late; lost four minutes on Hardscrabble Hill on account of leaky flues and bad coal; fifteen minutes at Coolredge, waiting for two freights to saw by—two fifty-car trains east ordered to meet double-header west; siding wouldn't hold; down trains couldn't back up.' I dislike very much to say anything to show that the coal-dust and snow now furnished, and called 'fuel,' is not bad—for it is—but here is a case of fool-dispatching. Coolredge holds twenty-one cars; a twenty-eight-car double-header is ordered there, against two fifty-car sections on down grade, for a meeting and passing point for No. 3. Time could have been saved by letting No. 3 meet the up freight at Downs and passing both sections there, or of holding the two extras at the junction for the up freight—they were ore or company coal loads. Will you charge this all to failures of motive power?"

The old man made another note.

"What about No. 9's engine, last Monday?" asked Mr. Sullivan.

"That was a failure of the motive power—a main crank pin broke. Some of Mr. Shaver's special brand of steel—cost the company a cent and an eighth less than the steel I ordered, but this one accident cost more than all the new crank pins put in in ten years—and besides, we haven't settled with Robert's widow yet."

The judge made another note.

"Your honor," said Skeevens, bowing. "I leave this specific case in the hands of the Court and jury. I confess that I find in these slips, made out by my orders, many delays for causes directly chargeable to the motive-power department. I should like to call your attention to one important point Mr. Sullivan has entirely overlooked, and that is the fact that we have not had a

hot box on a passenger-engine truck, tank or on any coaches in the past three weeks. I have put good lead-lined brasses under them all. When I get the mail and express cars fixed, we will be pretty free from that, if decent oil is furnished. Mr. Shaver's patent cheap brasses may do for freight cars that are too old for service, but we don't want 'em to run. I am after our men about hot boxes.

"There is a world of trouble ahead for us on account of bad material put into boilers, but we will have to shoulder that.

"Delays to passenger trains on this road is a scandal, and the whole truth is not told, even in papers that are agin' us; and I, for one, shall labor to reduce them—not to see how much I can make someone else reduce them. I am going after every cause of delay in my department and hunt it down, and I hope all the others will do the same. I shall suggest that the simple word of men at the end of trips shall not be asked about delays. Conductors will lie, and I have known engineers to handle the truth carelessly. Why not provide our engines with recorders? The record sheet tells the truth, the whole truth and nothing but the truth, and will compel others interested to tell the truth with it; and what we want is the truth.

"Mr. Sullivan is right in taking the matter up; his evidence is hearsay evidence, but it's the kind he has been used to. If we start to stop these delays on his information table, we start wrong. We want to give the medicine only to the sick men.

"With recorders on the engines, we can find the truth; then we can treat every missed connection and late train as an accident, and call for a report as such, and find the real cause of delay; then we can put the plaster on the sore place. I venture to say the motive power will have to bear its share, but it won't be lonesome.

"If everyone of us tries, he can do something to make it easier to get the trains through on time. Let's break up this Air Line habit of being everlastinglly late. Suppose there is no precedent for coming in on time, day in and day out—let's make a precedent."

Skeevens sat down and the Old Man got up, amid a profound silence.

"Gentlemen," said the general manager, "I second Mr. Skeevens' motion. Let's

every one of us tackle his part of this problem and show some results at our next meeting. Mr. Shaver, order enough recorders for all our engines—no, let's see, as many as Skeevers wants. If at any time within a year it's proven in one of these experience meetings that all our passenger trains have been on time for a month, I'll buy every mother's son of ye a suit of clothes; and if it ever gets so near millennium that all trains are on time for a month, I'll make it a house and lot, and drop dead into the bargain, and leave the job to Sullivan or Skeevers. Say! by George! how would it do to offer a prize to the engineer that brings his train in on time for thirty consecutive days?"

"Suppose you make it—unless delayed by causes beyond his control," said Skeevers.

"Oh, that would be too expensive."

"Well, outside of the motive-power department?"

"I'm afraid if you was the lawyer, Skeevers, that they'd rob the treasury and I'd have to fire Sullivan. You'd prove that the shadow of his car made the track greasy and that"—

His office boy brought the Old Man a message.

"What's this, what's this?" Putting on his "specs," he read aloud:

"'Engineers' Grievance Committee of the System respectfully ask that you name a day next week, preferably Tuesday or Wednesday, when they can meet you to talk over a matter of mutual interest."

"'Grievance Committee.' Holy Moses! and me having to go East to-night. Say, this beats the devil. Say, Sullivan—no; you better 'tend to the conductors. Skeevers, what do these men want? I don't care what they want, they can't have it. 'Grievance Committee.' Say, Skeevers, you see these men and settle with them. I can't bear to rawhide with 'em; they get me crazy. What do you suppose they want, anyway?"

"Same old thing—overtime, hostlers at terminals, and so forth."

"Well, Skeevers, you see 'em; but be firm with 'em, Skeevers. Say I was called East, see? Say the finances of the road won't"—

"But, Mr. Wider, why not go to the root of the matter and settle it? They have seen you three times in a year, and

you have been 'called' East twice; why not settle it?"

"That's the talk, Skeevers; 'settle it'; give 'em to understand that we can't afford to pay overtime. Why, Sullivan figured it up and it's a fortune, Skeevers, a fortune—and they are so damned unreasonable. But you can do it, Skeevers; give 'em one of your object lessons and show 'em—but how can you satisfy 'em? that's the point."

"If you leave it to me, I'll satisfy them, and save the company paying overtime to amount to 1 per cent. of the engineers' pay-roll."

"Say, Skeevers, do you want my job? No? Well, whisper; how will you do it?"

"Give 'em the overtime they ask!"

"The dev—! Say, but you said no."

"Then I'd stop the cause of overtime, and—presto, change!—there you are."

"Well, explain; I suppose it's another object lesson."

"Mr. Wider, there is not an engineer or fireman on this road that wants to earn a cent laying on sidings; but they do want pay when they are obliged to lay there. Pay them; then get after the causes of delays; stop this 'kid' train dispatching, and get some railroad men there. Stop this mahogany-desk train rating, and make your train-masters use a little sense and consult the weather a little in rating train-loads. Kill off some of these yardmasters who block yards so that trains can't get in. Lay off a few roadmasters who allow section men to take up rails on the time of regular trains. Stop this everlasting flagging of work trains against regulars. Hunt the heads of departments and bear down on those who produce no results, and in a few months you will have the trains coming in before the first hour of delay, which belongs to the company, is up. The men need rest, we want them to get over the road; nothing on a railroad earns a cent except the car-wheels—and then only when in motion. Move 'em!"

"Skeevers, I'll stay and see the boys myself—but you be there. You don't happen to have a twin brother just like yourself? No? I thought not; cusses like you come only one in a box—and there ain't but one box."

The assembled men felt rather out of the conversation, and commenced to look

at their watches and coats. The Old Man noticed this and dismissed them.

"Gentlemen of the jury," said he: "You couldn't have found any other verdict. You are all guilty! Go home and think, think hard, and don't dare to think what anyone else might or ought to do. Just think what you can do to relieve the situation, and one month from to-day meet me here and let me know just what you have done—not what you are going to do, but *net!* Good-night!"

As the Old Man and the vice-president went down the stairs, the general manager asked: "What do you think of my man, Skeevers?"

"Appears to know what he's talking about; wouldn't be surprised if he was a rough diamond."

"Rough diamond!" Why, sir, he's a regular diadem; yes, sir, a diadem, with Koorinoors and crown jewels and pearls and cut-glass and cats-eyes and whiskers on it. Why, sir, if I had a Skeevers at the head of every department of this road, I'd lay down four tracks of eighty-pound silver on rosewood ties inside of ten year! Yes, sir; and I'd equip it with nickel-plated '999's,' and I'd—well, say, I'd eat all the freight the Midland got to carry!"



Experimenting With Staybolts— Common Sense and Current Practice—Playing With Fire—A Simple Cure—Are We Criminally Careless?

Skinny Skeevers, like Br'er Rabbit, "he la' lo' en' sa' nuffin'" for six weeks—for Skinny was sawing wood.

Everything was running along on an even keel, some things a little better than they had been, nothing worse, and the men in the shop and in the office began to think that Skeevers had found his level.

Sol. Swishel, nicknamed "Old Penselwaney," remarked that, "His nips haz bid off more as a mout'ful. He ton't been no suber'dend't motif bower for a tam; yob too pig for 'im." All the members of the pessimist party in the Stove Committee agreed with Sol., but soon dropped the subject to exchange experience and tell lies about the "good old times," when they had pumps and outside oilers—and no time-card.

Last Thursday the general manager pushed open the door to Skeevers' office and asked: "Where's Jim?"

"Out in the shop, sir," replied the stenographer, respectfully. "Won't you have a chair, Mr. Wider? I'll send for him."

"No, I'll go out. Where'll I be likely to catch him?"

"In the boiler shop, sir—he's been livin' there for three weeks or more."

"Ha, ha," said the Old Man, "bet you 'leven dollar bill he's got an object lesson out there."

Skeevers was looking in the door-hole of a boiler set up on blocks when the Old Man showed up.

"What ye got, Skeevers?" yelled the Old Man, pitching his voice an octave above the music of the riveting hammers.

"New firebox," answered that worthy, laconically.

"Anythin' out of the usual?"

"Yes, I rather think it is—it's the only good job on the road. I've almost a notion to say it's the only safe one."

"Tut, tut, man! What if ye was called on a jury? Such talk would send us to, to—the next higher court—but that reminds me, Sullivan is cussin' mad about them new freight engines, and I've come up to see what ye got to say. What did ye reduce the pressure on 'em for?—they're bran new."

"I was afraid of 'em."

"Lisin' your nerve, hey?"

"No; losin' crown sheets and side sheets and no end of staybolts, and awful afraid I'll lose some boilers—and some men."

"Explosions?"

"Yes."

"Look out for them—an explosion is the worst advertisement a railroad can have, and costs the most money."

Just here the shop whistle blew; the machinery stopped, and Denny Conway left his sledge in the air, just where it was, and made a bee-line for his lunch pail.

"Thank the Lord, we can talk now without shouting our lungs out," said the Old Man, taking a fresh chew of fine cut. "So you're afraid of 'em, eh? Well, tell me what you're doin'—what did you do to this one to make it so good?"

"Well, you know we've had trouble with broken stays, cracked sheets and endless firebox grief"—

"Yes, and I remember two years ago, when you was foreman here, you showed me what poor staybolt iron Shaver was buying, and I let you order some fancy brands—what did ye ever do with it?"

"Well, I put a set of each of three kinds in the new fireboxes in the '78, '79 and '80, the old Grants; the '78' has Taylor iron; the '79,' Laurel Tennessee iron, and the '80,' Falls Hollow—been in from thirty to twenty-seven months."

"Any trouble?"

"Yes; just about the same as with the cheap—less of it, that's all."

"Broke?"

"No, less breaks than usual; but stripped in sheet, cracked sheets, and leaks—made up my mind it was something beside the material in the bolts. Just come over here; I want to explain to you."

Skeevers steered the general manager up to a dust-covered boiler on another pit.

"This boiler has a new firebox half set,"

said Skeevers, "and it's one I've experimented with a bit, to prove how not to do staybolt work.

"It was the day the '136' blew in her side-sheet at Downs, and the side-sheet and staybolt chill was on me in full force, that I happened in here and noticed the men putting in stays on this boiler.

"A big helper was screwing in stays on the side-sheet—the regulation staybolts, threaded all over and squared at one end to take the wrench. I noticed that he entered the staybolt in the outside sheet with his fingers, and then put on a little 6-inch wrench, running the bolt down to the inside sheet quickly, and then put on an 18-inch two-handled wrench, and threw himself on it and jerked and grunted to force the bolt into the firebox sheet. I thought that the outside hole had been tapped out a little to straighten up the threads and was a little larger, perhaps, until I noticed that the outside sheet at this particular point was a patch and new steel. Something wrong there, I thought; so I ordered him to take it out. He had a hard time of it, but it came out finally, and the thread that had entered the firebox was all 'chewed up,' half stripped. Then I commenced to think.

"If that staybolt was cut by one die, it must be practically true. But here's a place where 'practically true' is not true enough, so I measured the threads on several new bolts. They were 'out.'

"I then went and got the tap that the sheets were threaded with, took it to the tool room, and measured it carefully. It was one of the regulation kind—long reamer on one end, gradually becoming a tap near the shank, marked 12 threads per inch—it was a half thread too long.

"I went around the other side of this boiler and watched 'em tapping out holes. They put the tap through, entered it in the fire-sheet hole, and drove it through with the air motor. When the thread was being cut in the inside only the plain shank of the tap was in the hole in the outer sheet—no excuse for the threads being matched so that a bolt would screw through both sheets without trouble. The tap was not obliged to start at the same point in each sheet—I could fix that, and I did.

"I made a new tap, 12 threads to the inch, United States standard instead of

the 'V.' I made the thread tap proper only 2 inches long, and a second threaded hob behind it, and the same distance from center to center as the average distance between sheets in firebox sides—4 inches.

"Now, this tap being solid, the threads are true and in line, and after the threading tap has done its work in the outer sheet, the tap drops through, and the hob, or second set of threads, enters the threads of the outside sheets and holds the tool in position to cut the thread on the inside sheet, so that these threads will match the threads in the outside sheet—do you follow me?"

"Yes, yes; go ahead."

"On the end of this tap I made a rose-bit, as you will see, and no reamer on the shank. We punch all holes in the sheets before they are rolled up; we punch these $\frac{7}{8}$ in diameter. This rose reamer cuts out this hole 1-64 inch, and trues up the inside hole with the outside one.

"Now, I have here a true thread in both sheets, and a threaded bolt ought to screw through both sheets easy—but they wouldn't.

"My tap was true, but my staybolt was wrong.

"I had provided United States standard 12-thread dies, but the bolt-cutter wouldn't make a bolt and maintain 12 threads to the inch, do what we would. We could screw these stays into the outer sheet easily, but it was as hard as before to make the bolt enter the firebox sheet, and, after thinking it over, I decided that we could only succeed with a bolt cut with a lead screw machine. Then I was in despair, for I had no die machine, and to cut 'em in a lathe would make 'em as costly as silver. But Massey came to my relief."

"Massey! Didn't know he ever helped a mortal out of a hole in his life. Why, it was him that put all these staybolts in the wrong way!"

"The old way, Mr. Wider; everybody puts 'em in that way, even the best makers—but Massey helped me out.

"I went over to see him the last time I was up, and he was whining about what I'd like—a lot of extra tools.

"You know the Keyser Car Works, over on their line; been shut up for two years—failure—you may know that it was a wheel within a wheel—Midland officers

all in it—well, they had to take the works, and they turned over all the machinery to Massey to fit out his shops. It was all practically new, too. On a car I found an Acme bolt-cutter with a lead screw. It had been stopped with a job in its teeth, the threaded end of a truss-rod. I got this out and measured it, and it was to threads to the inch exactly. It had a lead screw for every pitch used, and in ordinary work the whole thread was used—no change gears, no worn screw in one place; it had United States standard dies, and was all ready for business. I wanted that tool worse than anything I ever asked for, but I didn't tell Massey so.

"Before I came away I bought that bolt-cutter; but Massey would not let it go unless I took the bolt-header that went with it. The header was just what I wanted, but I didn't say so. You will get a bill for these tools at half the list. I wrote Shaver about it yesterday.

"I got those tools to work day before yesterday—and here's the result.

"This firebox was put in with screw stays that fit in the thread. They were all put in with a 6-inch wrench by hand, and I watched 'em all go in. You could not tell when the bolt entered the second sheet. If there are any strains there, it is due entirely to the riveting, and is uniform and all in one direction. I believe it's the only good staybolt job on the road.

"In this half-finished job I have made some experiments. I found that the firebox sheets had to spring, sometimes in, sometimes out, to take the bolt—indeed, the boiler-makers often used a sledge on the side sheets to make a bolt enter. We cut off one bolt in there with a hack saw, and when two-thirds cut through, it broke with a report like a pistol, and the ends separated about 1-64 inch. The second bolt from it in the same row did not snap when sawed, but when the saw blade cut it through, it pinched the blade so that we could not get it out—and it's there yet.

"That is where the trouble comes from—the threads are stripped or the bolt is under compression or tension when it is put in, and before it is asked to carry any load. If a bolt is short, and under initial strain, while those around it are normal or under slight compression, the load it has to carry is many times that of its neighbors, and it breaks. That throws its

load upon those next to it, and in time these give way and cause a disaster.

"You may not realize the trouble we have. Last Friday one of our new moguls came in for a broken rocker. Being a good chance, I had the inspector look over her staybolts and test them with a hammer. He reported seven broken. We took them out, and only five were broken. When fired up, one bolt leaked, and when tested under pressure, we found fifty-three broken on one side—that's enough to make your flesh creep.

"No one but those who are held responsible know how dangerous this stay-bolt matter is, especially with the higher pressures—it's a veritable powder magazine. Almost every day we hear of locomotive boiler explosions.

"Our new engines are just as bad as our old ones—the staybolts are put in in the same way. Here's one of the bolts we took out of that new mogul. Look at it. It's threaded its whole length with a sharp V-thread. Now, if you wanted to break a bolt, you'd nick it. This has twelve nicks to the inch (more or less) clear around the bolt and sharp at the bottom—it would be a fool if it didn't break.

"Come over here and I will show you how I made the bolts for that firebox there in the '115.' This is my bolt-header—the one I got from Massey. I use staybolt iron $\frac{7}{8}$ inch in diameter, and use this header to upset the ends to 1 inch diameter, the firebox end an inch long, the outside end $1\frac{1}{2}$ inches long. Now, my cutter threads only these two ends; does far less cutting—hence more of it and more uniform work, and leaves the center of the bolt 1-64 inch smaller than the root of the thread. The skin is left on the iron; it is more flexible, does not rust, and, having fillets at each end of enlargement, has no nick for a breaking point. It has $\frac{7}{8}$ inch of clear, straight iron for strength, with the threads put on the outside altogether.

"I have ordered a set of these taps for each shop on the road. When they come, I shall order in all staybolt taps of every kind on the system and destroy them. I am going to order in all staybolt iron also, and make every bolt used on the road right here on this machine and send them out ready cut. In this way we will in

time get to a standard, and I am sure we will have safer and better boilers."

"Gosh, Skeevs," said the Old Man, dryly, "I was goin' to ride down to the office on the switch engine—but dogged if I don't believe I'd better walk."

"I guess she's all right," said Skeevs, "I reduced her pressure to 120 this morning."

"You practice what you preach, don't ye, Skeevs?"

"Well, try to; but really this staybolt question is a serious one. It is costing railroads thousands of dollars a day to watch and repair staybolts, and I believe half the trouble is solved by the use of the United States standard thread, a tap with correct lead for both sheets and a staybolt with a thread that matches the tap—all kept by gages to a standard. The trouble is not so much in the abuse of the staybolt after it's once in—it's the abuse it gets in putting it in.

"The old bolt had a drunken thread in a drunken hole; it was nicked to break; the thread was the worst form to secure even contact; the firebox end was often stripped in entering it—it is now, and always has been, a bad job.

"What we want in this country is more conscientious boiler-making—more brains and less bull strength. Go to the builder and see the piece-work rush in putting in stays, and then wonder we have trouble.

"Why are we running those boilers naked? To calk leaks in seams, because of that same rush and no care and no thought in the work.

"These builders and most of the master mechanics of the country will quote you the name and price of the boiler materials they use when disaster comes to their work, and perhaps they use the best materials. But suppose you bought a nickel-plated engine with all the latest kinks, and put her into service—wouldn't she go into the creek just as quick as a Black Maria, if you built a bridge pier on sand?"

"The firebox is the foundation of the locomotive boiler, and, no matter what the material, if the work is done wrong—if there are any sand foundations—there will surely be trouble.

"The more care and pains and knowledge used to properly construct the bridge pier, the more permanent and substantial the structure.

"Every minute of good work on a fire-box means hours of safety on the road. Every ounce of neglect means a pound of repairs—every atom of ignorance, an ocean of trouble.

"And if careful work will save anything on the Great Air Line, I don't propose to tolerate any 'good enough' boiler work."

"Correct you are, James," said the Old Man, reverently; "do so some more, from everlastin' unto everlastin', world without end. Amen!"

Piston Fits—The Worship of the Standard Idol—A Revolution in Cylinder Design—Frames and Binders.

The general manager's car was on the tail end of No. 3 Saturday, and at Granger he caught sight of Skeevers climbing into the smoker—he sent his porter after him.

"Skeevers," said the Old Man, benignly, "I jest want to 'gas' with you from here in; we'll have a bit of supper here and, well, perhaps I'll open the safe. Oh! ye needn't laugh—they are there! I keep 'em locked from Snowball here. The Sphinx left most of a box when he used the car last; he told me they were fifty-five a hundred—but such cigars you never put your lip over, Skeevers; finest thing I ever—what the devil is up now?"

"Emergency for something," said Skeevers, rubbing his head where it hit the partition.

The Old Man pushed a dent out of his hat, replaced it on his head, and followed Skeevers to the ground and "up ahead."

The engineer and fireman were taking down a valve stem—the right-hand piston rod had broken in the cross-head keyway and taken out the front head, slick and clean.

Skeevers went up behind Murray and asked: "Can you handle 'em over Hardscrabble Hill, Jerry?"

"If they don't stop me at Lowers, and I get a swing at 'em, I'll get over with one side; but, Jim, you know how like a log Old Frosty's hearse pulls?"

"Well, by ginger spruce!" exclaimed the general manager. Mr. Wider was originally from Connecticut, and on rare occasions some of the strange oaths of that strange country would escape him.

"Oh, howdy do?" said Murray, with a smile; "didn't know you was around—but, Mr. Wider, that car of yours does pull awful. Blow the whistle, Billy, we're



ready, and the whole trainful of people are on the ground."

"Old Frosty" and Skeevvers went back and climbed on the smoker, never a word being spoken until they had walked back to the private car.

"Old Frosty" and his "hearse!" exclaimed the old man—"well, by ginger spruce! oh! say"— Then he went over and fumbled with the lock of the little safe in the corner.

"Take one of them, Skeevvers; wash your mouth out and taste the nectar of the gods—I guess it's nectar, 'er nicotine, 'er sumpthin' else—it's good, anyway, especially for a 'hearse.'" Then he laughed loud and long.

"I tell ye, Skeevvers, it takes the boys to name things and name 'em right—'Old Frosty and the hearse'—well, by ginger sp—ho, ho! Say, Skeevvers, I forgot—ain't we breakin' altogether more pistons than the law allows—'pears to me I hear of a case about twice a week."

"I think about three a week would be nearer the truth," said Skeevvers, blowing a couple of blue rings above his head.

"You're so darn cool I dassent jump on ye, Skeevvers; for I know you've got one of them object lessons around to floor me with. I'll bet I can guess it, too—Shaver's poor material, ain't it now?"

"No; I think that the fault is entirely that of the head of the mechanical department."

"Well, by gum! that's refreshing, anyhow—why don't ye stop it? You're a great standard man; why don't ye get to a standard on this piston-rod business?"

"We are to a standard—that's what's the matter."

"I smell one of your object lessons. Let her all out now, Skeevvers."

"Mr. Wider, our pistons all break in the cross-head keyway, or just outside the cross-head—never broke one anywhere else. We have used all kinds of material—good, bad and indifferent. That piston rod that broke on this engine was Coffin toughened steel; ordered it myself. When we use that, or Taylor iron, or any good material, we have less breaks than with poorer materials—but good materials can't make up for bad design, can it?"

"No; that's a law."

"Well, sir, if there is one thing about the ordinary American locomotive that

shows bad engineering it's the cross-head fit of piston rods. Ours is the usual stiff taper, with a square shoulder and a key—worst thing that could be gotten up if we tried. In the first place, we reduce the area of the rod about a quarter to make the taper; then we leave a square shoulder so the rod can break easy; then we cut a keyway through the already reduced section, reducing it nearly a half, making a sure breaking point; then we drive a key, with a very slight taper, through the keyway, and pull that rod into the cross-head, putting a breaking strain on the rod before the steam is used at all. I'd be willing to warrant every one of them to break—there's something the matter with those that don't. On some roads they just taper the fit without cutting down a shoulder, without letting the rod bottom; others have a short, stiff taper back of the keyway—but they all have the key, and the initial strain, and trouble."

"Well, Skeevvers, if a bridge engineer found a girder too light for the load he'd increase the size—why don't you make a bigger rod at the fit?"

"Ah! there is where our sacred standard gets in its work. We have standard cross-head reamers—probably cost a hundred dollars—Massey made them eighteen years ago. Every shop has a stub-end standard sample fit for piston rods, and a square block of cast iron with a standard reamed cross-head hole, all fitted with a standard key. Every engine this company owns has those standard-size piston rods, except those last moguls—I let the builders put their own there to see what modern practice is—it's no better than ours. Massey's standard fit was adopted when the largest engine on the road was a 17 x 24 eight-wheeler, carrying a boiler pressure of 140 pounds. Our 19 x 24 ten-wheelers, carrying 190, have the standard piston fit—and I am ashamed to say it."

"Why don't you throw the gum-sizzled reamers away and make 'em bigger?"

"Can't do it; cross-heads are nearly all of cast iron, and the piston bosses are as light as they ought to be now—a new standard fit means new cross-heads, and new cross-heads means a big appropriation to cover the expense."

"That's different," remarked the Old Man, thoughtfully.

Skeevvers and "Old Frosty" smoked in

silence for ten minutes; then the Old Man broke out:

"For the Lord's sake, Skeevens, let's don't have standard fits on these ten new engines we're talking of—I ain't so sure I won't commence having fits of some kind myself."

"I shall ask you to approve of several innovations on those engines before the order is given."

"I'll do it now; what kind of piston rod fits will you suggest, though?"

"Well, I have several plans: One of them is to leave the rod straight, cut a standard thread on it, make the cross-head in halves, tap threads in the cross-head fit and clamp it on to the rod by four bolts. Another is, to make the rod perfectly straight, let it bottom in the hole, and use the same key we do now. Perhaps this last is the best and cheapest; the strain of the key would be back of the key-way; it would cause no bursting strain on the cross-head boss, and it would be strong like this"—Skeevens took out his note-book to make a sketch, the Old Man looking over his shoulder as he turned the pages.

"Hi, there, Jim! what's that ye got there?"

"Well, to tell the truth, Mr. Wider, it's a collection of innovations that I didn't intend to show you yet; just some stray ideas in memorandum form that I hope some day to find a chance to try, but not yet."

"More O. L.'s, hey?" asked the general manager.

"O. L.'s?" asked Skeevens, taking his cigar out of his mouth and looking at the Old Man.

"Yes, yes; O. L.'s—object lessons, of course."

"Oh!" said Skeevens.

"Well?" said Wider.

"I don't suppose you have a very good idea how much trouble we have from cracked cylinder saddles, cylinders loose on frames, frames broken, steam pipes leaking and other diseases due in a large measure, I think, to the general use of the half-saddle cylinder. Now, there is a sketch of a half-saddle engine, as usually made. The lightest part of the affair is at the point where frame is fastened on. Through this casting there is a cored hole that forms part of the steam pipe, another

one that forms the exhaust passage, and four holes for the bolts that fasten on the frame. In making this an expensive pattern is necessary and an expensive casting produced. This must be planed at the joint with its mate and bolted together. It must be planed at the frame fit and on the seat, to say nothing about steam and exhaust-pipe fits and stud holes; but most expensive of all is the fit of the saddles to the smoke arch—which must be done by hand. If anything happens to the cylinder—well, take the '86,' in the shop now; struck a car and cracked cylinder—all the joints and fittings must be made anew, a new saddle supplied, the engine pulled apart, and the loss of its use for two weeks or more. After about two years' service our big engines commence to crack their saddles—and there is no cure but renewal. Constant trouble and expense in this line led me to study on a plan to avoid it, and the more I planned the farther away from the standard half-saddle cylinder I got. I find that our old eight-wheelers do not break saddles nor get frames loose, while all the '180' class do, as well as our moguls. 'Why?' I asked myself. Well, sir, I went out and spent the best part of a day lying on running boards and front ends, and came home convinced that it is caused primarily by the constant weave, come-and-go of the frames; the engine on one side jerks the frame toward the cylinder in one direction, and the other side shoves them apart, and then they reverse—you can see 'em move. 'But why didn't the old engines do the same?' you may ask. Because they couldn't; the frames were tied together by long, heavy trusses at each end! The big deck plate saved the old engines. The new ones, with long fireboxes on top of the frames, have only a narrow tail-piece. Those two Rogers moguls have an angle-iron bolted on back of cylinder saddles and a flat piece of boiler iron riveted to it and the frame makes the cylinder saddle longer, but not long enough. I propose to cast the cylinders separate from the saddle'—

"That's what our old Schenectady engines had," said Mr. Wider.

"Yes; but they had a cast saddle separate from the rest. I wont have any other casting but the cylinders."

"I'm listening, Jim."

"In order to accomplish what I want, I

shall flatten the front ends of the frames; so that, instead of being 4 or 5 inches square with half their metal cut away for holes, with hooks to go each side of the saddle and wedges to go between the hooks and the saddles, I shall have two frames, 8 inches wide and only 2 inches thick. Then I will buy a piece of 1-inch steel or iron boiler plate, 51 inches wide and as long as I want, and lay it flat on my frames, as you see it in the sketch. Then I will cast my cylinder, without saddle, but with a long lug, or rib, on one side. This rib will be 8 inches or more wide, and will be planed up on the under side. This I will lay flat on the big plate, and bolt the three together with bolts 1½ or 1¾ inches in diameter. Don't you see I will have room to stagger my bolts? They will be short and large, and the holes can be easily reamed. I will be able to put in fifteen or twenty instead of four, and will have three or four times the strength of the ordinary cylinder fastening. You see, the deck plate, or whatever you may call it, can be as long as there is room for or as is required. The lugs on side of cylinder can be longer than the cylinder if it is thought necessary. Just see how easy it is to put on a new cylinder if one gets broken. Just see what a truss that inch plate is—edgewise, remember; all the work is done on it edgewise. Why, sir, you couldn't budge that kind of a layout with four times the pressure in cylinders four times as big. You couldn't!"

"But, hold on, Skeevers; where's your saddle, and what is that sewer on top of the steam chest for?" asked the Old Man, pointing to the sketch.

"Oh, yes; why, properly speaking, there will be no saddle, as we know it. On the bottom of the smoke arch, which will not be all cut away as it is now, we will rivet—rivet, mind you—two flanged steel plates practically the shape of the sides of our present saddle. These two sheets of pressed steel will have flanges at the bottom that set down flat on the deck plate, and their edges will abut against the cylinder lugs. I will hold them down with four or six bolts; the front and back can be closed by plates of any thickness, either fastened to the side pieces or not. When I want to take my boiler off, I shall take out the bottom bolts, knock off her rear anchors and lift it off—saddle and

all—with the crane. One saddle fitted in boiler shop when the engine is new will outlast the boiler. The center plate can be wide enough to fill between the frames if necessary. My steam pipes will come from the nigger-head straight toward the bottom of arch, and then turn, going through side of arch, and have a ground joint on side of chest. That 'sewer' is the exhaust pipe. The valve will be balanced and the back cut out of it; and the exhaust steam, instead of going up under the valve, down into the exhaust port into the saddle, and then up to the nozzle, will come up out of the cylinder, up through the valve, and up through the pipe and the stack—no turns, no baffles. This may not look pretty, but it's ideal piping. Don't you see that there isn't a trap or a pocket in it anywhere. A drop of water in either the steam or exhaust pipe must run, by gravity, into the cylinder and out of the cylinder cock. I may have to make my valve a little larger; but if I do, I will shorten my steam ports and decrease the useless clearance. I think such a plan would stop all trouble with cracked cylinders; stop leaky steam pipes and broken frames, cylinders getting loose; reduce the expense of replacing a broken cylinder by half; be lighter and better and—well, homelier than anything we've got. What do you think?"

"Sure it would know it belonged to the railroad when it looked in the glass?"

"I think perhaps it would recognize itself as a locomotive."

"Don't think it would suck cows, or nothin' like that, Skeevers?"

"Alas and alack!" exclaimed the designer, in mock despair. "I knew you would not see the improvement—plain as it is. I am like all the rest of the benefactors of mankind—ridiculed, laughed at. Why, Mr. Wider, in the language of Colonel Sellers, 'there's millions in it'; millions of kegs of dollars—and two 12-inch bungholes in each keg!"

"Take another cigar, my boy; it will quiet your nerves," said Old Frosty. "Lemme see that sketch again. Looks kinder English, er French, er some kind of foreign. Say, Skeevers, I want one of them to run on that club train—them anglo-maniacs that smoke pipes, roll up their pants and play golf. Bet you it would just tickle 'em to death. We could

name her 'Prince of Wales,' or 'Lord Algernon,' or something—but say, Jim, what kind of a checker-board is this?"

"That is the front frame of the 'Prince of Wales.' You see, it will be 2×8 in front, and I taper it back, keeping the same area of metal, and near the jaw widen it in a vertical direction, cut away half of it, and do the same for the frame ahead of the jaw, and bolt them together with short stiff bolts. I have then a frame with twice the strength of the ordinary frame, without keys, with less fitting than the old splice, as shown in the sketch below. I can take that apart easily, and it is not in the way of anything. Again, it lets me widen the foot of the jaw and cut a wide slot, say $2\frac{1}{2}$ inches, clear across it to take in a lip I will make on my binder. Did you ever notice our regular binder? Well, it is heavy; but we cut it almost half in two to make a fit over the end of the jaw, then we bore a hole in the weakest point to hold it up—it's no wonder they are chronically loose. My binder will have a stud-hole through the strongest part—where the rib is—and the rest of it will be straight. I will put one big stud there, and it will pull up right in the proper spot, and keep pulling."

"Do all these changes necessarily go with the new cylinder rig?"

"No; but they are in the line of improvement."

"Skeevs," said the old man, solemnly, "you may now kneel down and receive my blessing; I'll just have one of the new engines built your way."

"You go down East with a drawing of that in your pocket and the builders will have you put in the asylum."

"Well, what would you do?"

"I'd quietly put it on the '38'; she's in with both cylinders and her front frames smashed up, anyway, and we can experiment with her."

"Do that, Skeevs; do that. Be quiet about it, though, and for heaven's sake don't say I told you to!"

"If I rebuild the '38,' she will be the worst example of anti-standards of the G. A. L. that you ever saw!"

"Standards be cussed, by ginger spruce! We'll show 'em some standards that ain't so old as Methuseler! But, Skeevs, listen; if the Sphinx should happen out and I wasn't here?"

"I'd have to say it was the invention of an outsider—one of our biggest shippers, and—well, here we are, home again, sir."

"Say, Skeevs, don't forget, if any of them reporter cusses come around, jest tell 'em—hem! lemme see—well, that we expect to have the yellow fever down on the Gulf branch this year, and that this thing is an automatic sewer deodorizer and atmospheric disinfecter, and that the G. A. L. proposes to take care of its patrons, body and soul, yellow fever or no yellow fever!"



**Oil Economy and the Hereafter—
Pints or Cents, Tons or Dollars
—The Performance Sheet.**

Jim Skeevers has had a rest for a couple of months—no vacation, of course; they only come in the higher official circles—but the “Sphinx,” who is president, and the “Old Man,” who is general manager, went to Europe in June. Besides that, Sullivan, the general superintendent, let a livery horse run away with him and break his leg; the chairman of the Grief Committee was elected sheriff, and quit the road; Sarah has a new Skeevers baby, and in many forms things have “been comin’ his way.”

Before “goin’ foreign” the Old Man ordered Skeevers to suspend all new work, reduce the shop hours, and to “choke things” until after election.

“When we get this sixteen to one business settled we’ll do something,” wrote the Old Man.

Skeevers knows to a dead certainty that in his secret heart the Old Man is for silver, and he also knows that the “Sphinx” is gold to the gizzard, so he keeps wondering which side must win to get that mysterious “something” started. He is strongly of the opinion that “something” will be done if there is freight to haul this fall, regardless of who is elected.

The “38” is still standing in the back shop, the “pinch” stopping work on her, and the new form of cylinder fastening and frame fit, and all that, will have to wait for trial until “this sixteen to one business is settled.”

Skeevers knew he would get no vacation, and that it was absolutely useless for him to ask vacations for his division men, but he sent them on trips to look up certain matters in various shops and take notes of anything worth imitating. It might not have been all accident that he sent each of them into the neighborhood of his old home, and it was certainly in-

tentional when he told each to "take it easy." He got passes for the wives, too, and told each man to put in a bill for expense while away.

Some railroad officials would object to the expense, but, now that the last one is home and has made his report, Skeevvers figures out that the information gained is going to save the road over \$400 this year alone.

Just before the Old Man went away he called Skeevvers into the office, gave him a cigar and a seat, and then pulled out a roll of blueprints.

"Skeevvers," said he solemnly, "I want to jest call your attention to these performance sheets of the six roads that touch ours. I am not satisfied with this oil service—not by a darned sight."

"Neither am I," said Skeevvers.

"Well, why don't you stop it?"

"I don't think it would pay."

"Oh, say, Skeevvers, I'm in earnest."

"So am I, sir; and if you will listen I think I can turn some light on the subject for you!"

"An object lesson?"

"No; just a plain statement of facts. Mr. Wider, you know that your wish, my policy and the only way to conduct business is for the head of each department to mind his own business"—

"Yes; you just bet."

"Therefore, I have no criticism to make, although I may appear to do so. My department uses all the oil; who orders it?"

"Well, I do; you know it's a sort of hobby with me."

"All well and good. I don't want to order it; but if I did I should cut the amount down at once."

"Is this a conundrum, or the string you pull the 'O. L.' out with, Skeevvers?"

"No; neither one nor the other. I think your standard of measurement is wrong. I should change the measure at the oil house."

"One of them fool sixteen to one jokes coming now," said the Old Man, half to himself.

"You buy three grades of oil and mix them at the oil house—a formula you bought. Our engine oil costs about eight cents a gallon, and cylinder oil, say, twelve and a half. Is that about right?"

"Yes; just about."

"You change the measure at the oil

house and we will come up somewhere near the other roads."

"False bottoms in the measures?"

"False measure altogether."

"I'm listening, Skeevvers."

"You throw away the pint cans and measure by a dollar bill and see where the Great Air Line would be."

Mr. Wider consulted the blueprints.

"It's in pints on 'em all."

"So it is. But take the Midland; they oil by contract with the Galena Oil Company; their oil is worth three or four times as much per gallon as ours, but a dollar's worth of it will run farther with safety than a dollar's worth of ours."

"I never had any use for that scheme of oiling by contract—seems like callin' in an outsider to attend to your work; but blamed if I don't believe if they'd a' put it to me that way I'd a' listened. If you say you will run farther on a dollar's worth of their oil I'll buy some; we don't want no contract, though."

"Mr. Wider, the men have been educated on this poor oil; they must make up in quantity what it lacks in quality, and they use more than they should if the oil was good. When the new oil comes they will waste a lot of it, and we will have six months of work and worry. You want results, and the best results could be had by giving the contract outright for engine and car miles. Your economy commences at once then; they will send men well up in 'oilogy' to train the men. Their plan will knock the pints on the performance sheet into the figures you want to see, and the road will be ahead on the dollar-bill measurement."

"By ginger spruce, I believe you're more'n half right."

"I know that is right, Mr. Wider. If all performance sheets were figured on the dollar standard, instead of pints and pounds, some of the record breakers would be sick, and people might see why it is possible for some of our roads to pay dividends and yet have a bad oil record. Oil is only the blossom on the vine—the potatoes are under ground and out of sight."

"Here comes another," chuckled the Old Man; "have another cigar, Skeevvers?"

"Thanks! If you want some net results to show the president when he gets back, give me authority to do as I want to in the matter of fuel, and I will agree to save you

a dollar bill for every postage stamp you can save in the oil business—do what you will."

"Say, Skeevvers, who's givin' this lecture and who's the audience? I called you down here to set out your packin', and blast me if you ain't doin' all the talkin'—but go ahead; I'm a enjoyin' of it."

"You perhaps haven't thought of it in that light, but there are a great many ifs to the oil economy scheme. It's economy if no damage is done, no cylinders cut, or valves and seats scored, or axles hot and brasses ruined, with their resultant delays and losses for repairs, and the engine being out of service. You remember the Bible question: 'What profiteth it a man if he gain the whole world and lose his own soul?' Railroad managers should not look alone on the few cents saved in the first place, and not, also, look ahead into the hereafter—there is a red-hot sizzling hereafter to some of this oil economy. Not so in coal economy; a dollar saved there is a good, clean, clear dollar made—and no fear of a hell to follow."

"Say, if my wife gets hold of you there will be a man about your size teaching Sunday school in Dr. Parker's church."

"When you come back I'll have a new performance sheet that measures oil in dollars and cents—you said you'd contract the oiling or buy better oil?"

"Yes, and I'll abolish the fuel department and put it under you."

"No, I don't want it; let the fuel agent buy and distribute the fuel, but order him to buy *one kind* for my department, and not to change the kind or quality without my consent. Now, he will change for ten cents a ton, and we are burning four or five distinct kinds of fuel; an engine drafted properly for one kind will not burn the other at all with economy. With one kind I'll put them all in shape, and then we will ask the boys to be careful. We will labor with 'em, instruct 'em, interest 'em in the work and encourage 'em to save coal. The new performance sheet, figured in dollars and cents, will interest them more than pints and tons. Let promotion, preference for runs and standing depend on how many cents a man can haul a ton of freight a mile or a hundred miles for—then you will get results. If you let me do this my way I'll consult the boys. I'll say to 'em: 'Here, boys, we

have been giving you oil that cost seven cents a gallon; we are going to give you some that costs twenty cents and will go five times as far—be careful of it.' I'll let 'em vote for the kind of coal they want, and tell 'em we don't care a continental how much it costs, we want the best results; we know we have the best men in the country, and we propose to give 'em the best fuel to work with. Every mother's son of 'em will vote for Frost Creek coal—it costs—lemme see"—

"Two seventy a ton," said the G. M.

"Two seventy, as against one ninety for Eldorado"—

"Good deal of difference there, Jim."

"Yes, sir, *in tons*; but a dollar's worth of Frost Creek coal will haul a ton of freight more miles than a dollar's worth of Eldorado—you don't care for tons; it's dollars, remember. The Frost Creek dollar does more work for you than the Eldorado dollar, and we can't maintain 'em at parity any longer."

"James Skeevvers," said the Old Man, as he took "Skinny" by the hand, "if our party wins this fall I'll be tempted to make a trip to Washington to get ye appointed Secretary of the Treasury—there's only one thing that stands in the way—and that is that I want you right here. When we get back I want that dollar performance sheet and some net results. When the 'Sphinx' comes out to the annual meeting I'll put him into a trance, or else this here hypnotism of yours is a joke and I'm a jay from Jaytown."

Skeevvers and the boys have been wrestling with the fuel problem all summer; the Old Man has just returned, and Skeevvers tells me that he's getting some figures on coal that will interest people—perhaps he'll tell his wife a secret; my wife and Sarah are friends, and if he breathes it I'll let you know right away.



The New Performance Sheet
Where Light Trains Were Not
Wanted—More Ways Than
One to Handle Men.

Skeevers and the boys have been wrestling with the fuel and oil economy problem.

Skeevers got up his dollar performance sheet and left out all reference to pints, pounds and tons. At the top of the sheet he had a plain statement of the kind of fuel used and the price per ton, the kinds of oil used and its cost per gallon. Opposite the numbers of the engines came the names of the engineers, as usual; then the fireman's name; following was the monthly cost for fuel, oil, supplies, repairs, etc.; then the cost per mile for oil and fuel, and finally the cost per ton hauled *per mile* for both.

Skeevers allows a certain amount of fuel and a certain amount of oil per mile for each class of engine for running the engine, and then bears down hard on the cost of fuel and oil for hauling tons of freight miles—that's what counts.

The first two months Skeevers did not allow for running the engines at all, and some curious things happened.

In the first place the men soon discovered that the fellow with the lightest trains made the worst records, and the peculiar anomaly of an engineer kicking because he had light trains was presented when Hank Bitters came into Skeevers' office and "made a holler," as he called it, because his local train was always light one way, and he explained his poor record to Skeevers thus:

"Mr. Skeevers, it's like this: If I run my consolidation over the division light, it takes considerable coal and oil; if I pull six cars, the amount used by the engine is divided up between the six loads, and if I pull twenty, it's divided up into twenty parts. The fellow with the full train has the advantage every time. Now, I'm on

local one way, and usually have a very light train most of the time. You ought to allow so much coal and oil a mile for engines, anyhow, and just count what a fellow uses in doing work that the company gets paid for. What d'ye think?"

Skeevers thought Bitters was right, and said so.

One day, as Skeevers was going through the roundhouse, the boiler washer was blowing off an engine, and the house was full of fog and noise. From the depths of this gloom Skeevers heard the sonorous voice of Rory Moore, the traveling engineer, jacking up a runner for a poor oil record. Skeevers listened:

"Now, Tom, this is the last time I'm a goin' to tell you," said Rory. "You've had notis enough. Git right down to business, and use as little oil as any of 'em, or I'll pull you off the run. See! The Old Man (meaning Skeevers) is a goin' to have results or jobs. I don't care if you have a new engine; the road's goin' to have less oil used. Cut! Well, let her cut; don't you use the oil, or I'll pull you off. Remember that. Why, when I used to run the '16' I could"—

Skeevers didn't wait to hear that; he knew it was twenty years since Rory had run anything, and that he couldn't get over the road with any kind of a modern engine in anything like modern time or with modern economy.

Skeevers waited until afternoon, and then sauntered around to that same engine and called Tom down. Tom was ugly mad at what Rory had said—came down with a bad grace.

"Tom," said Skeevers, pleasantly, "would you mind going down on the Coal Creek branch for a week or two, as a special favor to me?"

"Well, I don't know, Mr. Skeevers; but I—say, does old Rory ever go over the branch?"

"I'm afraid not much"—

"It's all right; I'll go. I don't care much about bein' away from home and leavin' the '310' here. Can I have her when I come back?"

"Yes, Tom; you can take her with you, if you'd rather. I'll tell you. I've got a lot of young fellows down there that are careless, and I can't interest 'em in this oil or coal saving—they see so much coal they think it costs nothing. I want to

send a good, careful man down there to set 'em a pattern—going to commence a special bulletin for that branch next month. Now, I know you can do it, and do it right and honest—use all that's necessary and not waste any. You know there is nothing like a pattern to build to. Much obliged, Tom; I knew you'd help me out. I'll send you down soon as I am ready. How's she doin'?"

"Pretty fair; got her to steaming now; but she runs a little warm yet, and—well, I have to use a little more oil than regular; but I'll do the best I can."

"I know you will, Tom. Go out to the storehouse and tell Harry I said to give you a package of that flake graphite to put in her boxes; she'll be all right. So long!"

Tom scratched his head for three minutes, and then went and looked on the performance sheet for his name; it was down near the tail; then he scratched again and went home. That night he told Tom, Jr., who is a fireman, that Skinny Skeevers was the decentest man that ever had charge of anything, and a man that wouldn't try and help him out ought to have his gullet cut.

And say, Tom did go down on the Coal Creek branch, and he did set the boys a pattern that will make 'em hump to equal. It's funny, but the men there said he could run light on oil because he had a new engine—same reason Tom first claimed for using more!

There are more ways than one to handle men.

Skeevers thought long and hard over what he should do with Rory Moore, the traveling engineer. Rory had a leg broken through his own carelessness, years before; but that was in the days when everybody was against the railroad, and rather than let him sue for damages, they created a soft place for him and agreed to give him a life tenure for it. Skeevers figured it out that the company would have been "in" big money if they had let him sue. He antagonized the men and loved to show his authority rather than teach; he always said "Go," never "Come;" unlike Skeevers, he was no leader.

Skeevers had just concluded to ask the general manager to "promote" him to some job in the water department, when Providence came to his aid and sent Massey over on a visit.

There had been talk of a strike on the Midland and Massey was scared; he always had a blue funk when he heard that the engineers and firemen were uneasy. He had spies out, but they seemed to report little to comfort him, and Massey was suspicious of 'em, anyhow.

"Now," said he, "if I only had Rory over there, he'd find out for me and he'd jolly 'em up. Great man to go among men and get 'em satisfied. That traveling engineer I had was no earthly good; always messing around about coal and oil economy and a regular crank on air brakes; had to set him back runnin'. Now, Rory"—

"Glad you spoke of it, Mr. Massey," said Skeevens; "was just wondering what I'd do with him. Got orders to cut expenses again; thinking of putting him on the pay car. If you can give him a better job on the Midland it will help all three of us out—he's out in the roundhouse now. Jimmy, Jimmy! go out in the roundhouse and find Moore; tell him Mr. Massey wants to see him in my office right away. Yes; Rory would find out all that's goin' on for you. They couldn't do much in a division that Rory wouldn't put you onto," said Skeevens, lowering his voice and winking at Massey.

Skeevens talked gravely of the troubles from organized labor, and the value of a peacemaker general, until Rory came; then he left the two worthies alone for half-an-hour.

"Mr. Skeevens," said Rory, coming into his private den; "Mr. Massey wants me to go to the Midland. I don't like to leave you, but he offers more money—but I've got a life job here, and"—

"Let me congratulate you, Rory; it's a great chance for promotion. Don't you see that Massey, poor fellow, is sickly—on his last legs? You go, and go right away; be his right-hand man and you will soon be—well, you know."

Then Rory thanked Skeevens, shook his hand warmly, and went out and clinched matters with Massey.

Verily, there are more ways than one to handle men.

The news of Rory's resignation leaked out quickly, and inside of twenty-four hours it had got down to the general office. As soon as the general manager

heard it, he wrote a personal note to Skeevens as follows:

"My Dear Skeevens—Just learned with pleasure that you had buried another dead man on the Midland. That's right; let them have all of them. Rory has been a thorn in my flesh for years, with his confounded life contract. In reference to the position, I would consider it a favor if you promote Engineer E. J. Staver to the position. We want young blood; I think he is capable, if he is a nephew of mine. I used to have compunctions about this relation business, but they have worn off—everybody favors relations; it's natural.

"A. W."

Not content with that, he dropped a line to his nephew and asked him to call upon Skeevens in reference to a new position.

That very evening, as Skeevens was enjoying his after-supper cigar, Staver rang the door-bell and was ushered into the Skeevens sitting-room. Skeevens welcomed him warmly, gave him a cheroot and talked about the weather. Mrs. Skeevens took the baby into the next room, leaving the men to themselves.

"Well, Ed, what's new?" asked Skeevens.

"That's just what I come over to find out," answered Staver. "I got a note from 'A. W.' when I got home to-night, to call on you about another position, and, being as I live in the same block, thought I'd come over and find out what was up."

"I got a note, too," said Skeevens, slowly, blowing a cloud of smoke toward the ceiling. "I suppose you have heard that Rory Moore has quit?"

"No! I thought he had a cinch."

"Well, he did have; but he traded it to Massey," and Skeevens laughed.

"Well, Mr. Skeevens, was you considering me?"

"Yes, Ed; I was just thinking about you and that job when you came in; and do you know what I thought?"

"No; but I'd like to know."

"Well, I was thinking that it would be a bad thing for you, for me and the service—but especially for you."

Staver kept still and looked solemn for a minute, and Skeevens continued:

"There are a good many reasons why you would be a dead failure in that position, and to fail in such a job at your age

is a set-back for life. Now, you can't afford to fail, can you?"

"No, I don't want to, but I'm not so sure I would. I think I'd like it, and no one would try harder, Mr. Skeevers."

"I know that, Ed; that's the worst of it. You'd fail for other reasons than the ones you were to blame for. Let me explain it to you.

"You are not a favorite with the men. Now, a traveling engineer don't need to be a favorite, but he must be a man that they like and respect as an engineer—one they can look up to as being as capable as any of them.

"You came on this road about ten years ago to fire; was put to work ahead of a lot of men on the list. Why? Because you were a nephew of the general manager.

"You were promoted two years earlier than other firemen. Because you were a better fireman? No; because you were a nephew of the general manager.

"You pulled freight eighteen months and was given a light passenger run ahead of a dozen older and as capable men. Because you were a better engineer? No; because you were a nephew of the general manager.

"You are looked upon as a man among men who is not to be judged upon his merits, but his blood—a man with a pull.

"Now, I believe you are a good engineer; above the average, perhaps. But you cannot be judged on your merits here. I believe you want to do the fair thing, and go to the front because you deserve to, don't you?"

"Yes, I do; and Mr. Skeevers, I've often thought I'd quit and go on another road, just for the way the boys hold me under suspicion like. I've never tried to join their lodges, for I know they think I'd carry things to 'A. W.' But"—

"Well now, Ed, look here. You are a young man yet, and there's lots of room for you on your own merits; let me help you out. I don't blame you; you were pushed ahead, and, like most of us, took what the gods sent and was happy—most human beings would. You take my medicine and I'll warrant a cure of all these ills, or no pay. What do you say? The medicine is unpleasant to the taste, but good for the system. What do you say?"

"I'll do just what the doctor says," said

Staver; "and really, Mr. Skeevers, I'd rather be figured on as E. J. Staver by all hands than as Mr. Wider's nephew—I ain't to blame for being a relative of his, am I? A man has to have some relations."

"I've always noticed that they do," answered Skeevers, lighting a fresh cigar. "But listen—the doctor is prescribing now.

"In the first place, I want you to write 'A. W.' a nice note, telling him you don't want the job—that all hands would say that it was on account of your blood, and not your ability; that while you are proud of the Wider blood in your veins, you want to show the men and the officials of the G. A. L. that you are an engineer first and a nephew afterward, and you think you can do that best on a freight engine, and have asked me to transfer you to one. Have you got that?"

"Yes; go on."

"Then write me a note, asking to be transferred to a freight engine on the division farthest from headquarters, and simply add that you realize that older men and better men deserve the easy runs, and that you want to work where the men don't know who your relations are. Stop there and don't tell a soul that you have written either note."

"Yes; anything else?"

"You are a single man and don't care where you are. I'll send you to Granger to trade off with a man who wants to move here on account of his children going to school. You go into the freight pool there and saw wood. You have something in you; get it out. You stand at the head of that performance sheet month after month, and show all hands that it's Ed Staver and not A. Wider that is backing you, and then I will have a good reason for promoting you—and I will promote you. Your reputation with the men leave to me. I'll square you there, and I won't be all winter about it. I've got the 'leakiest' time-keeper on earth in Ball; he's a chronic gossip. I left the Old Man's letter, equal to a command, about your taking Rory's place, where Ball would see it—he has peddled that out long before this, and the Stove Committee are discussing it now. Just you keep still and leave that to me. Can you go to Granger Saturday?"

"Yes," said Staver, getting ready to go. "I'll be glad to, and, Mr. Skeevers, I want to thank you for this talk—I'm going to surprise you; watch me. Good-night!"

"James," said Sarah, ten minutes later, "I was just thinking that there are more ways than one to handle men—that's one way."

The next morning Skeevers ordered the roundhouse foreman to put Ole Sanderson on "7" and "8" regular, and send E. J. Staver to his office; then he took a long walk through the shop.

While he was out, the Old Man came in, nodded to the clerks, got into Skeevers' chair in his little glass pen—out of sight of the door—hunted through the drawers for a cigar, found it, put his feet on the desk and waited.

Skeevers came in and stopped in the outer office to wash his hands; before he was through the door opened and a half-dozen engineers filed in under the leadership of Milt Smith.

"Good morning, Mr. Skeevers," said Milt. "Don't git scairt; this ain't no Grievance Committee. We jest come in to ask you one question; then we're all a goin' to kneel right down by that railin' and pray that you answers it the way we want yer to. There ain't no manner o' dou't in any of our minds that you had a reason for chain-gangin' the passenger engines; but now that the '511' is out, we hope and pray that you give us our regular engines agin."

"Well, boys, I'll relieve your minds right now—you will all have your regular engines again to-morrow, the 1st. I did have an object in the change; that object has been accomplished, and we will go back to the old way—it's the best."

"Boys," said Milt, solemnly, looking around to them, "shall we kiss him?" Then, recovering himself suddenly, he said: "Really, Skin—I mean Mr. Skeevers, we are very much obliged, and while on the thanks branch we want to say that we thank you for putting Sanderson on the run that belongs to him by rights; he ought to had it when young Staver got it; but that was a'fore your time. O' course, you can't help pushin' the young lad along—we know how that is—old Rory wan't no good, and the kid would have to be mighty poor if he could-

n't do better than him, and lessen he gits to feelin' his oats and gits"—

"What are you driving at?" asked Skeevers.

"Why, our new traveling engineer, Mr. Staver, of course; you know he's got a cinch; but Lord, man, we don't blame you!"

"Now, boys, look here; this is too bad. Just let me tell you something. You don't and never did give young Staver credit for what he is; as engineers go, for a young one"—here Skeevers bowed to the veterans—"he is above the average; but if he was the best and was promoted, you fellows would not give him credit. Now, I don't know as a man is justified in showing private letters, but here's one from Staver that shows that he's a man among men; for mind you, he could have had Rory's place if he had wanted it, but he refused it!"

"Refused it!" said three men at once.

"Just read that out loud," said Skeevers, producing Staver's letter from an inner pocket and handing it to Smith.

Smith read:

"Jas. Skeevers, S. M. P.:

"Dear Sir—I hereby make application for transfer from passenger to freight service at your earliest convenience. In making this request it is due you to explain that I recognize now more than I did at the time that older and better engineers are entitled to easy passenger runs. I request that you send me to the farthest end of the road, where I can be known and measured by my work and not by my blood relations.

"Respectfully yours,

"E. J. STAVER.

"Private."

"Milt Smith, all of you," said Skeevers, "you have misjudged a man. There's a boy who wants to stand on his merits with the rest of you and don't want any advantage, yet you fellows won't let him. It's you, not he, that mention his relationship with our general manager."

"That's right, Skeevers," said Milt; "and here's a sucker that ain't afraid to say so to him. I'm agoin' right out to the roundhouse and shake hands with the young feller; he's the making of a man."

"No use now, Milt; he's in Granger; went down on No. 1—going to run out of there. But mind you, he deserves your

respect; he's the peer of any of you; don't forget that when you do see him."

"Well," mused Squire Tobin, "if Mister Staver ain't going to be traveling engineer, who is?"

"That's to the point," said Skeevers, smiling, "and it also brings us back to the original question—the chain-gang. I don't know as it's good policy to tell who you are going to promote before they are consulted, but I guess it will be safe this time. You remember that I told you when the new performance sheet was adopted that promotions would be made on that, other things being equal? Well, I meant what I said. Who stands at the head of the list, and has stood there from the first?"

"Barney Murray."

"Right, and Barney Murray will be your new traveling engineer. Some of you complained that he had the best engine, had different injectors, patent valves, etc., and that anyone could show a record if given an advantage—that's why I chain-ganged you last month."

"The new sheet will be out the 2d, and you will see that it was not the engine, but the man. Barney Murray will be at the top there, too. Besides that, Barney is an engineer capable of imparting his knowledge to others; his firemen are the best-posted freight men we have on the road, and he graduates quite a number. He is the man who asked to go with the air-brake car when it came—some of you were ready to sign a petition to send it away. Barney knows you all, is square and fair, and won't expect too much of you. But take my advice and follow him; he can lead you all right; and don't forget that the record is what counts—not your age, or your relationship, or your pull, but what you can do as engineers. You are doing well on fuel and oil; but look out for some of these freight men; they are thinking and working—sure to do something."

When the men got into the roundhouse again, on familiar ground, they talked over the whole matter and agreed that things couldn't be better. Barney Murray came in to register and was pulled into the circle and congratulated, and just when the good feeling was at its best the "present fiend" arose and said: "I move that we present old Skinny Skeevers with a gold watch for Christmas; he's hot stuff."

There were ten seconds to the motion; but Barney Murray held up his hand for silence, got it, and said:

"Boys, Skeevers wouldn't take it; don't you remember five years ago, when a paper was passed for a gold watch for Massey, and half the men on the road had signed it; when it got to Skeevers and he wouldn't sign, and raised such a row that Massey had to order the paper withdrawn? You might pass a resolution, or something, but you couldn't give Skeevers a watch; he wouldn't let you."

"A testimonial, that's the thing," said one, "engrossed, framed and"—

"Mon," said Sandy Taylor, the roundhouse foreman, who had joined the crowd, "d'ye mind a teestamonal jest till the mind o' Maister Skeevers? It wad be fra the shape o' blueprint and framed wi' the reegular frame a the hoose awa'; it's the gude showin' o' savin' coals the mon wants for a teestimonal fra' ye, d'ye mind?"

"Sandy's right," said Milt Smith, looking over his crowd; "we couldn't please Skeevers better than by making a showing on that performance sheet; it's results he wants; that's his success and ours, and I, for one, propose to try to improve my record; and boys, boys, if all of you didn't steal so much coal and oil I would be the bull o' the woods."

As Skeevers went into his office, the Old Man slowly took his feet off the desk, opened the drawer, took a fresh cigar, and said:

"Skeevers, me boy, I came up in a hurry to see you on a certain matter, but I'm going back. I heard what you said to the gang—dead right—couldn't be no righter—you done that almost as good as I'd a' done it myself; all of which reminds me of that true old saying, that there is more ways to skin a cat than to run her through a potato peeler."



**Skeevvers Runs Up Against a New
General Manager — Fallacies
About Upsetting Staybolts
— How to Keep the
Standard — Some
Advantages.**

You remember I told you about Skeevvers' staybolt improvements, a long time ago. Well, Skeevvers has had trouble since then.

The first-off everything went well. Skeevvers captured all the staybolt taps on the system, and sent the new ones in their places. All the bolts were made at headquarters, and the subject seemed settled, and settled right.

But one morning last winter an engine came out of the house draped in black and white. Soberly, solemnly, slowly, silently it took its place on the turntable, and as slowly and silently moved down the yard.

Another and another draped in the same way crept out into the daylight and the cold and moved away.

There's always something funereal-like and solemn in a draped engine by daylight, and something weird and uncanny and ghostly at night.

The Old Man had been promoted. The genial, bluff, honest old general manager had had a tussle with pneumonia and been defeated.

Like many another man, he was a martyr to his inherent desire to lead. He went out with a snow-bucking brigade and met the enemy.

There was genuine sorrow on the road—a friend had gone—the engines wore their weeds for the regulation thirty days, while all employés, high and low, wondered what the new manager would be like. For, mind you, corporations wear no crape, mourn no dead, nor do they miss anyone very much. In due time a new general manager came on from the East.

He was young for his position, say thirty-five; he was someone's son; he was a graduate of a technical college; he had worked several years as assistant freight agent of a big road, of which his father was a director, and always asked the reporters to mention him as a self-made man who came up from the ranks.

He made a great many people connected with the G. A. L. very tired before he got through with them. Being authorized to put M. E. behind his name, and thinking that the book-cramming of mechanical lore that had been stuffed into him ten years before was better than all practical experience in the world, bothered Skeevers a good deal.

The first day he came to the shop he shook hands with Skeevers warmly, said he always liked to meet a mechanic, was a mechanic himself, graduate from Slight-em, and asked Skeevers what "tech." he graduated from.

Skeevers pointed to a long freight train that was toiling up the grade just beyond the shops and the long line of narrowing ribbons of steel that stretched away toward Granger and the setting sun, and remarked, laconically, "That." The new G. M. just gave him one of those "Oh, you poor, ignorant cuss!" looks and turned away. He never asked Skeevers' advice on things mechanical after that—he advised Skeevers, or oftener ordered this or that done, without consultation. This made Skeevers itchy; if Mr. Wider had been there he would have demanded his engine back, but Skeevers was past that now; he must remain superintendent of motive power or nothing.

One day, six weeks ago, Mr. Toping—that's the new G. M.—was taking a turn through the shops towing Skeevers in his wake. He was hunting for something to order changed.

They had got through the blacksmith shop, and the new G. M. M. E. had his hand on the latch of the boiler shop door, when that Acme header of Skeevers' started up. The G. M. M. E. went back to it.

"What have you here, Mr. Skeevers?" he asked.

"A bolt-header, sir. We upset these staybolts at the ends so that the center of the bolt is a little smaller than the root of the thread; we have to cut less threads,

the bolt is lighter, and does not break so quick; besides, we have a system of"—

"But, my dear sir," interrupted the manager, "you break the fiber of your iron in this upsetting process; that's bad engineering, sir, bad engineering!"

"It works very well in practice. We have no trouble with staybolts since we have used this system, and"—

"Yes, yes; that's all right, Mr. Skeevers, but this is all based on a theory that is radically wrong. You get a copy of 'Rodam on the Metallurgy of Metalology,' or 'Spinkham on Molecules, Globules and Fibers of Iron and Steel,' and you will find I'm right. This upsetting breaks the fibers, sir, and makes your larger end actually weaker than the smaller part not so mistreated."

"But, Mr. Toping," said Skeevers, quietly, "I have a more recent work on the subject that goes far to disprove the broken-fiber theory, and if you will suspend sentence on the whole process until to-morrow I'll show it to you."

"Who is the author?"

"Well, I must confess I have something to do with the authorship."

"You—writing on metals—why, what do you call the book?"

The idea of this ignorant man writing on a mechanical subject sort of took his breath.

"Well, sir, the name is hardly decided on yet; thinking of calling it 'Some Recent Experiments with Staybolt Iron.'"

"Oh, it's only in manuscript yet?"

"Hardly that, sir. If Mr. Wider were alive he'd call it an object lesson. I'll bring it down to you in the morning."

"All right," said the G. M. M. E., as he went into the boiler shop, and in his mind he pictured how bare and poverty-stricken and uninfluentia a title page would be without a list of colleges and professorships and association symbols following the name of the author. How dare a man do it?

Once rid of his visitor, Skeevers went right back to the smith shop, he sorted out several pieces of staybolt iron himself, marked them, had each one heated as he wanted it and headed them up in the machine.

He carried them himself to a planer hand and had them carefully planed half in two and polished, then he took them

to old Jimmy Simpson in the tool-room and went to his office.

That evening old Jimmy left a package on Skeevers' desk, and Skeevers took it home, and the next morning he put it into his overcoat pocket and went down to the general office.

Mr. Topping was anxious to see Skeevers. The fact that Skeevers, his master mechanic, was liable to write a book on metallurgy seemed to impress him, and, truth to tell, he hardly knew whether Skeevers was about to make a fool of himself or be admitted to the circle of immortals who write technical books, but he leaned strongly to the fool theory.

Skeevers unrolled his samples of staybolts and, with a twinkle in his eye, said:

"Mr. Topping, this is my 'book'—just a practical demonstration about that fiber theory propounded by you yesterday. I must confess I could not answer you then, for I did not know. But, sir, this is an important matter, one on which my reputation and yours, the reputation of the company and the possibility of its losing lots of money on a misjudgment depends. We can't afford to be wrong, sir."

"Very true, Mr. Skeevers, but"—

"This," said Skeevers, interrupting, "will, I think, settle that question. These experiments cover all the irons we can use and all the ways we can upset it; now, you be the judge."

"Now, sir, after you went away I personally collected these specimens and saw the work done. This specimen, numbered 1, both on the bolt itself, and this print taken from the face, was etched on a bolt of Taylor staybolt iron upset with one blow at white heat—our regular practice. No. 2 is Taylor iron upset with four blows at a dull red heat. No. 3 is United States iron upset with one blow at white heat. No. 4 is United States iron upset with four blows at red heat. No. 5 is common iron rod upset in our box dies with longer fillet—an improvement in shape—upset at white heat. No. 6 is common iron not upset.

"Now, sir, in all these cases it was necessary to rust these specimens in order to show the fiber. I don't think you can find any evidence whatever of a broken fiber in any of these bolts."

Skeevers glanced at the G. M. M. E., but there was no sign of a give-in—he

himself had said it, and if those fibers had not broken so much the worse for 'em.

But Skeevers' is a tactful man, and he was beginning to understand the weak places in the G. M.'s armor. He couldn't be made to own up and give credit as Mr. Wider could; he would never pat Skeevers on the back or brag on him if he ran the engines ten miles on a pound of coal. Skeevers aimed lower, and before his opponent could fire a short.

"I met Mr. Dix, superintendent of the Mathematical Bridge Works, in the car coming down this morning, and asked him if they used upset threaded ends for truss rods, etc., in the best work, and he says they don't use anything else. Mr. Dix is a graduate of the Slightem Polytechnic—the G. M.'s *alma mater*—and says that Professor Thrashem made some experiments three years ago to test the strength of such work, and was so impressed with its value that he has prepared a paper on the subject to be presented to the British Society of Mechanical Superiority, which will afterward appear in book form."

The cloud on the brow of the G. M. M. E. cleared up.

"I'm mighty glad to know that," said he enthusiastically; "leave Professor Thrashem to find out the truth. If he says that upset ends of bolts under tension are correct it would be idle to dispute it—they are all right, go on and make 'em, it's undoubtedly a new step in engineering.

"And besides, Mr. Skeevers, my clerk has been telling me about your staybolt work, and showed me an article in 'Locomotive Engineering' about it. It is a good thing, and as nearly perfect as anything I have found here. Go right ahead and carry it out strictly to the letter—I believe it's perfect. Good morning."

Such praise was praise indeed, and Skeevers whistled softly to himself all the way back to his office, stopping once in a while to say in a whisper, "Nearly perfect; I believe it's perfect," then he whistled again. Queer chap, is Skeevers.

When Skeevers sat down at his desk the first thing that met his eye was a letter from Owens, at Granger, saying they were in trouble about staybolts for the "218." After some preliminaries, he wrote:

"I think the trouble is in the cutter; the bolts are larger; they can be forced in with a 20-inch wrench, but it's work. Evi-

dently the test plate with hole tapped by standard tap is worn by constantly screwing bolts into it, and has allowed the operator to let his dies wear large—what shall we do?"

Skeevvers wired Owens to wait until he came down, as the "218" was in no hurry, and went home wondering what was wrong with his "perfect" system.

Before Skeevvers could go to Granger he was called East by a death in the family, and while in New England made up his mind to see a few men and a few shops he had long wanted to visit.

It so turned out that within a week from the time the G. M. M. E. had pronounced Skeevvers' staybolt scheme "perfect" that Skeevvers climbed the stairs in the old stone office of the B. & A. at Springfield, Mass., to make the acquaintance of the Supt. of R. S., Thomas B. Purves, Jr.

Mr. Purves was in the midst of a pile of interchange repair bills and cigar smoke when Skeevvers' card was put on his desk.

"James Skeevvers, S. M. P., Great Air Line—show him in!" said Purves, going to the rail to shake hands with his visitor.

"Say, Skeevvers, seems as if I had known you for ten years; been reading about you, and—how's the object lessons?—have a seat—have a cigar."

In ten minutes he was calling Skeevvers "Skinny," and Skeevvers was calling him Tom, and they were "railroading."

"By the way," said Purves, as he shut off his talk to relight his cigar, "I adopted your staybolt scheme the minute I saw it; best thing I ever saw."

"Well," said Skeevvers slowly, "hope you won't be disappointed. My new G. M. says the system is perfect, but I'm not dead sure that he knows. We struck a snag the day before I left."

"What?"

"Bolts wouldn't go into holes. My division man says we've let the bolt cutter die get large, and of course the tendency is all that way, but he seems to forget the tendency of the tap is also to wear small. Anyway, they are off, and the 'perfect' system needs perfecting."

"We've been all through that, and have it down to a nicely—I'll show you."

Purves pulled out some drawings.

"Well, here's a picture of my taps and gages. I don't happen to have a set here; but now, just as you say, the tendency is

for the hole to become smaller from wear of tap, and the bolt to become larger from wear of die. Here's how we take care of all that.

"In the first place, we provide a standard male gage—we'll say this is our set for $\frac{7}{8}$ -inch bolts. This male plug is hardened and ground twelve threads to the inch, United States standard, and gets no wear, for it is only used to test the size of the adjustable female gage.

"This female gage is used to test the staybolts daily, and they must all just screw into it, and it is kept just right by the male master gage.

"Now, we have a hob for trueing up the dies. It's plain that by this plan you can keep your bolt output right up to standard size.

"The staybolt tap, with reamer on end to true up hole—same as yours—cutting threads and the guide threads to enter the outside sheet and insure the threads in the inside sheet being in alignment with those on outside sheet.

"Here's where you are liable to get into trouble—this tap will wear, and almost before you know it some outlying shop has tapped a lot of holes a thousandth or two too small.

"We take care of this by our adjustable tap; we can adjust this to the female die and run it through the sheets to clean up the holes to the standard and not stop the work. This is only used after the error is enough to notice; and a new tap is asked for at once. If your man at Granger had one of these he could have gone right along, corrected his work, kept to standard, and only bothered you for a new tap."

"S. W. Card Mfg. Co.," said Skeevvers aloud, as he copied the maker's name in his book. "When I go home I'll have a set of those taps and gages or know the reason why."

"Say, Tom," said Skeevvers, "I'm going home and tell the general manager that I have adopted the Purves staybolt scheme, and don't you ever tell anybody else you've adopted mine, and don't josh me about object lessons; you're full of 'em yourself."

At about this stage of the game they were joined by another master mechanic, who had called to pay his respects to Purves. He is one of those self-conscious old fossils that stood well up in his busi-

ness twenty-five years ago, and can't realize that he is still away back yonder twenty-five long years—one of the kind that calls petrification by the pet name of conservatism.

All the staybolt business from A to Izard had to be explained to him—he never heard of Skeevers—he never reads.

"And you tell me," said he, "that by a cuttin' of these bolts on a lead screw bolt cutter you can get a true thread, and that by a watchin' of all these gages and taps and hobs you can make all the bolts in one shop and send 'em to the other shops and they'll fit, and they'll go in with a little 6-inch socket wrench without squarin' the ends. Well, now, tell me what ye've saved."

"Trouble," said Skeevers.

"Money," said Purves.

"Well, now, boys, ain't you a settin' up a straw man to knock down? Ain't the old threaded-all-the-way staybolt good enough? Ain't the common bolt cutter and the home-made tap good enough? What's the use in cussin' the hoss that's carried you over the creek?"

"I'll tell you," said Skeevers, "you say you are runtin' 130 pounds pressure yet on a small road using small boilers. Your company sells coal and lets you waste money on your engines. We have to watch every cent, have to spend money for these tools to save money in the work and repairs.

"First, we do a better job. Second, we save money.

"We upset our bolts, at first using a straight bolt—what's the use of a staybolt larger than the root of the thread?—this leaves the skin of the metal on, is stronger, prevents rust, and instead of threading $5\frac{1}{2}$ inches of bolt we only thread $2\frac{1}{2}$ inches—less work. We save more than half their cost by cutting them all at one place especially fitted up for it. Now, in Mr. Purves' latest design of staybolt he retains all the advantages of the first form and saves, on $3\frac{1}{2}$ -inch water space bolts three-quarters of a pound per bolt, a saving of $4\frac{1}{2}$ cents each where 6-cent material is used—this is enough to pay for cutting the bolt and tapping the hole. Besides that there"—

Tom touched Skeevers' foot and winked.

Skeevers stopped talking and lit a cigar—the old man was asleep.

How a Good Thing Gets Introduced —Some Little Annoyances of Master Mechanics.

James Skeevers, superintendent of motive power of the Great Air Line, was in trouble.

A superintendent of motive power is generally in trouble.

Skeevers has a new general manager, who is young in years and experience and is trying to make a reputation.

Like many other men who inherit or marry a "pull" that puts them in positions of command, the new general manager had an idea that to be familiar with all the details, and run them, would show his ability to swing everything on a big railroad.

The new general manager had been taught in his youth, as most of us have, that old, old chestnut about looking after the pennies and the dollars would look after themselves.

This proverb is good for boys and in the small affairs of life, but it's suicide for a man in charge of a big railroad.

The new general manager had been to a dinner of railroad men, where the irrepressible oil crank read a memoranda of the miles his engines ran on a pint of oil, and showed what a saving in *pints* his management had made.

Mind you, he didn't say a word about *dollars*—for the saving in them wouldn't pay his salary for three days.

Well, the new manager took notes of the miles and the pints, and when he got home he compared them with the performance sheet furnished by Skeevers—then he wrote Skeevers a letter.

It wasn't a letter asking if he couldn't get the boys to do better on oil, or if there were any local conditions that prevented a better showing—there wouldn't be any authority in that—it was a letter stating that the amount of oil used was out of all reason and must be stopped at once, that

so-and-so many pints for valves and so-and-so many pints for engines was enough—all other roads used, and all this road was going to use; "please see that these instructions are carried out forthwith," etc., etc.

Skeevers read this letter over twice, put his feet on the window-sill and commenced to think.

Skeevers thought of a way out of the difficulty.

There was one way—a first-class machine shop had offered him a job as superintendent; but that seemed like a retreat to Skeevers, and Skeevers is not much of a retreater.

Skeevers came up from the ranks on this very railroad, learned the trade in the shops, fired and run engines for years, and knew a lot of things about oil and the craze on skimping it.

For one thing, Skeevers knew that the amount of money wasted in oil was not very large, and he also knew that he could save more dollars in coal than pennies in oil, and yet the oil problem was not to be despised, and must be met.

While he was looking out of the window Jerry Sullivan backed his big mogul down near the office, and took his long-spouted can and two hundred pounds of engineer down to oil 'round.

Jerry is a good careful man with oil, and everything else, and Skeevers watched him.

The Great Air Line furnish the plain, mongrel breed of tin can, with 22-inch spout, a filling plug and, generally, a gob or two of solder around the bottom, where it has been repaired. Jerry started at the back driving-box, made a quick dive with the spout between the spokes, lifted the sheet metal box cover with the spout, and with dexterous turnings of the wrist put the thin oil on wedge and shoe and box packing, and then withdrew the spout with a quick drop of the right elbow—this to stop the flow of oil.

For all this care—and Skeevers couldn't have done it better—there was a nice little canal of oil across the hub of the wheel; but Jerry wiped it off and went on. When it came to the links and eccentrics Jerry couldn't help pouring a steady stream of oil from one small oil hole to another, as it was impossible to stop and start the flow of oil for each. Skeevers watched him oil

around and back down for his train, then he went out and looked the ground over.

There was a very complete plan, in oil, of Jerry's engine; every driving-box and truck box, eccentric and link was properly located—on the ties.

Skeevers went back and figured that Jerry or the "109" had lost at least a quarter of a pint of oil—and Jerry was probably the carefulst runner on the road.

Then Skeevers figured out that an engine in service gets, probably, three good oilings in a hundred miles, or an average day's work, to say nothing of extras for guides, eccentrics, etc., between times, and that he had in service 217 engines. If he could save the waste in oiling the engines would not get skimped, and it would make a show.

Skeevers made a bee-line for the tin-shop.

"Josh," said he, "we've got to get up a valve oil can that will shut the spout with a valve and spring, something like this," and Skeevers fished out a pencil and made a rough sketch on a sheet of tin.

Old Josh didn't say a word, but went to a cupboard and got out half a dozen cans, of all shapes and sizes, in all stages of decay—and all of 'em had valves. He picked out one that was a twin sister to the one Skeevers had pictured.

"Well," said Skeevers, "what was the matter with that one? I remember they were tried a long time ago; but I never got one then, for I was running out of Granger, and all the new things were tried up at this end of the road."

"'T wan't no good," said Josh; "leastwise it didn't work, sir; cost twict as much as a good tin can—yes, three times. Allus needed fixin', and the engineers didn't like 'em—dog-goned engineers never do like nothin' new, anyhow," muttered Josh.

Just here John Melvin came into the tinker shop to get a new bottom put into his tallow pot—isn't it curious that the boys will call 'em tallow pots yet, when valve oil superseded tallow fifteen years ago?

"John," said Skeevers, "you were here when all these cans were tried—what's the matter with 'em?"

"Well, sir," said Melvin slowly (Melvin was a careful man), "they were a nuisance, mostly because they were no good anyway, and some because they was made poor and took care of poor. Now, this

one, as you can see, has a valve up in the spout; a crooked wire goes down the spout, makes a turn in the can, and comes up through this stuffing box with a thumb button on it. When you press this button the wire pulls the valve *down* into the spout. If the least bit of waste or raveling gets in there it will stop up the can, and you can't get it out—the spout is soldered on.

"Well," continued Melvin, "Massey (the ex-superintendent of motive power) got up this here other can to overcome the objections to that; it's got a big valve right at bottom of spout—flat disk on end of lever opens down. This drizzles about as bad as any can when the valve is shut, because the spout is full of oil. The filling hole is higher than the valve, and in this case was a good brass plug screwed in, with a knurled top. Why, Massey got a patent on that can! He'd a made a go of it 'cept for Doc Kellogg. Didn't you hear of that? Well, Doc was firin' for Jerry Sullivan then; he filled one of them cans one cold day, and run it over, of course (that's the way to tell when they are full); then he screwed down the plug and set it on the boiler-head shelf.

"Well, sir, ten miles this side of the Springs that can busted, and give Doc a shot of hot oil right in the neck as he was puttin' in a scoop of coal. The door bein' open, he took fire and was bad burned—got the marks of it yet. He jumped into a snowbank and saved his life. Jerry climbed out on the running board to get away from the fire, and the '98' had a cab burned off before he got her stopped.

"Old Man Wider came up to the shop the next day, and you ought to a heard him lay down the law to Massey. All the patent cans was took off the engines that night, and we ain't been bothered with 'em since."

Skeevens went back to his own office.

"Supply man here," remarked his clerk; "left a note for you and a package; said he was going over to see Massey; be back to-morrow."

Skeevens' clerk was very laconic; he was washing up, for it was five minutes of six, and he had a new wife in a new house.

Skeevens opened the note and read: "Mr. Skeevens: Here is an oil can that is

all right; take a look at it, try it, criticise it—see you to-morrow.

"P. S.—Price \$1.50 each—last three tin cans.
R. USHER."

Skeevens took two cans out of the package—one was cut open on side to show internal economy—looked at them until whistle blew, and then bundled them up and carried them home.

Skeevens spent two hours fooling with that can in his kitchen sink; then he sat down, looked at the sectional one and made notes, until Sarah Skeevens declared for the seven hundred and seventeenth time that if he didn't stop bringing home his worry and work she'd burn every blueprint and smash every brass faucet he brought into the house.

The next morning, after opening his mail, Skeevens took the cans and his note book to the general office. In an interview with the new general manager he told all about his investigation of the waste of oil in getting it on the engines; told the whole story about the old cans that had been tried, and then sprung the new can.

"Now, sir," said Skeevens, warming to his work, "here is the can we need, I think. In the first place, it is made of pressed steel—it will last the life of three tin cans at least. The valve in spout opens up—easy to clean. Valve, rod and spring come off with the spout—get-atable. Fills through spout connection—no plug to leak. Has an air chamber inside that is always open to atmosphere—through the lever shaft, which is hollow—but only to can when valve is open. Shuts off oil at right place in right way; engineer can deliver but a drop if wanted. It's a mechanical job, ground joints—no leather gaskets, no packing, to wear out or get lost and make the point of spout point toward handle of can. There are no 'jim-cracks' to get out of order; the whole thing from tip to base is made of No. 22 B. W. G. steel; couplings are all brass; spring is bronze, and the whole thing is nickel plated. Why, sir, the meanest engineer on the road would take care of that can. Keep it clean, and he couldn't help using it right."

"I think all the saving you want can be made by using these cans—and the engines will actually get and use just as much oil as ever."

"Ahem! How much did you say that can cost, Mr. Skeevvers?" asked the new general manager.

"One fifty, sir."

"And the regular cans?"

"From 45 to 70 cents, according to quality."

"And you, a man in charge of an important department, advise me to spend a dollar extra for each oil can on the road, just to prevent careless oiling by your engineers?"

"Well, hardly that. I ran an engine on this road for more than ten years. I know it is impossible to oil around with a plain can without wasting *some* oil, especially in getting can to and from awkward places like the links, eccentrics and truck boxes."

"Mr. Skeevvers," said the new general manager, with a cynical smile, "this is not the Pennsylvania. We have no money to burn on fads and nickel-plated notions."

The new general manager looked at a card his clerk handed him, and added:

"I shall take up this matter of extravagance in oil personally; in fact, I have already done so—tell him to come in."

Skeevvers decided that he was dismissed, and he took his temper and his oil cans back to the shop. On the way to his office he went through the roundhouse, and noticed an indignation meeting of engineers in front of the bulletin board.

The new general manager had posted a red-hot notice about oil economy, with a stinger in every line of it. This was not the first time the new general manager had gone over his head in things mechanical.

Skeevvers went to his office and wrote three letters; here they are:

"Mr. H. I. Toping, G. M., G. A. L. Ry.:

"Please accept my resignation, to take effect at 6 P. M., this day and date."

"Mr. Jno. Davis, Pres. Davis Manufacturing Company:

"I will accept your offer, and assume duties the first. Hope I can please you."

"Mr. Robt. McVicar, Denver, Colo.:

"Your oil can is the best in every way that I have ever tried. No mechanic who has used an oil can can help seeing its advantages. The new general manager of the G. A. L. won't buy anything that will save money; he wants the men to do that. I shall use your can, in a limited way, in a

new field which I enter next week. You might call on Mr. Toping, but wear an overcoat—you will get a frost.

"JAMES SKEEVERS."



